"How's Business?"

WHENEVER and wherever one business man meets another these days, whether they be representatives of big business or little business, "es macht nix aus," the invariable greeting is: "How's business?" and the invariable answer is: "Rotten!"

There the business conversation generally quits. What's the use? Enough has been said. They both understand that neither of them have any solution to offer for the hesitant market. So they tacitly agree not to discuss it any further. And that's a mistake. For business is not "rotten."

"Rotten" means "unsound." To let go unchallenged the statement that "business in the United States is rotten" is to contribute to the propagation of an untruth, which, having gained wide currency, can bring about an adverse situation or prolong a recovery from an industrial indisposition.

Business is not rotten. It is sound and on a healthier basis than at any time since the great war began. Every fundamental of business is sound.

A summary of the situation for the first quarter of the year shows that:

"First, the output of iron and steel has been greater than for the first quarter of any previous corresponding period.

"Second, revenue freight carloadings were 122,000 more than for the first three months of last year, and continued to surpass and exceed the April carloadings of 1924.

"Third, bank clearances the country over made new high records. May 1st clearances in New York were $1,697,000,000—a new high record for all time. By a strange coincidence the last previous high record was January 2nd of this same year, when they totaled $1,665,000,000. May 1st clearances at Chicago were $192,400,000; the same day the previous week they were $106,000,000; and for the corresponding day a year ago they were $140,300,000. So far this year total bank clearances are 15 per cent more than for the first four months of 1924.

"Fourth, automobile manufacture has been steadily increasing with production soundly adjusted to sales eliminating chances of over-production.

"Fifth, industrial employment has increased with more people gainfully employed at profitable compensation than for any other period since 1920. In addition there is a very notable absence of any serious labor troubles.

"Sixth, the building and construction program in the country shows a 15 per cent advance over the same season of 1924 and is just now, owing to a favorable spring, swinging into full operation.

"Seventh, the agricultural situation has materially improved. While first reports on wheat yield prospects are lower than last year, yet the price is from 40 to 50 per cent higher, and the whole structure of agricultural prices is in better balance than any time since 1920, and indications point to a still further marked improvement this year.

"Eighth, the big mail order houses, reflecting as they do the buying activity of the rural districts, report increased sales for April over the same month a year ago, and an increase of 13 per cent for Sears Roebuck and 8.4 per cent increase for Montgomery Ward over first four months of a year ago.

"Ninth, financially we are sitting on top of the world. Credit abundant, money cheap and plentiful. Federal Reserves high and prospects prime for an indefinite supply of capital for all industrial and commercial needs of the country and the world.

"Tenth, the foreign trade of the United States is not only greater than a year ago but mounting higher and higher each month. April exports are probably the highest in the past four years. Even the paper industry is exporting paper products at the rate of over $25,000,000 a year."

And finally, we quote last week's review of the wholesale drygoods trade by Marshall Field & Co.:

"Current wholesale distribution of drygoods was in excess of the volume recorded for the corresponding week a year ago. Road sales also were greater."

Where is there anything "rotten" about those reports? Look at the situation a year ago in Europe. Consider the industrial and commercial condition under which foreign business men tried to operate. Debased currency—no credit, busted nations; discouraged people bowed with debt, taxes and privations of ten years' accumulations.

We would call business under those conditions "rotten". And look at the foreign situation today. What a marvelous change!

May 1st this year saw England and Holland resume specie payments, and Mr. Hoover reports that all but 10 per cent of the world's trade is now on a gold basis as a result of Great Britain's action. What does that mean?

Advancing raw material, wage and commodity prices abroad; sounder, healthier, better business, and living conditions abroad.

The finish has been put to the practice of cheap, wild-cat, piratical production abroad to compete with our high wages, high living standards here at home.

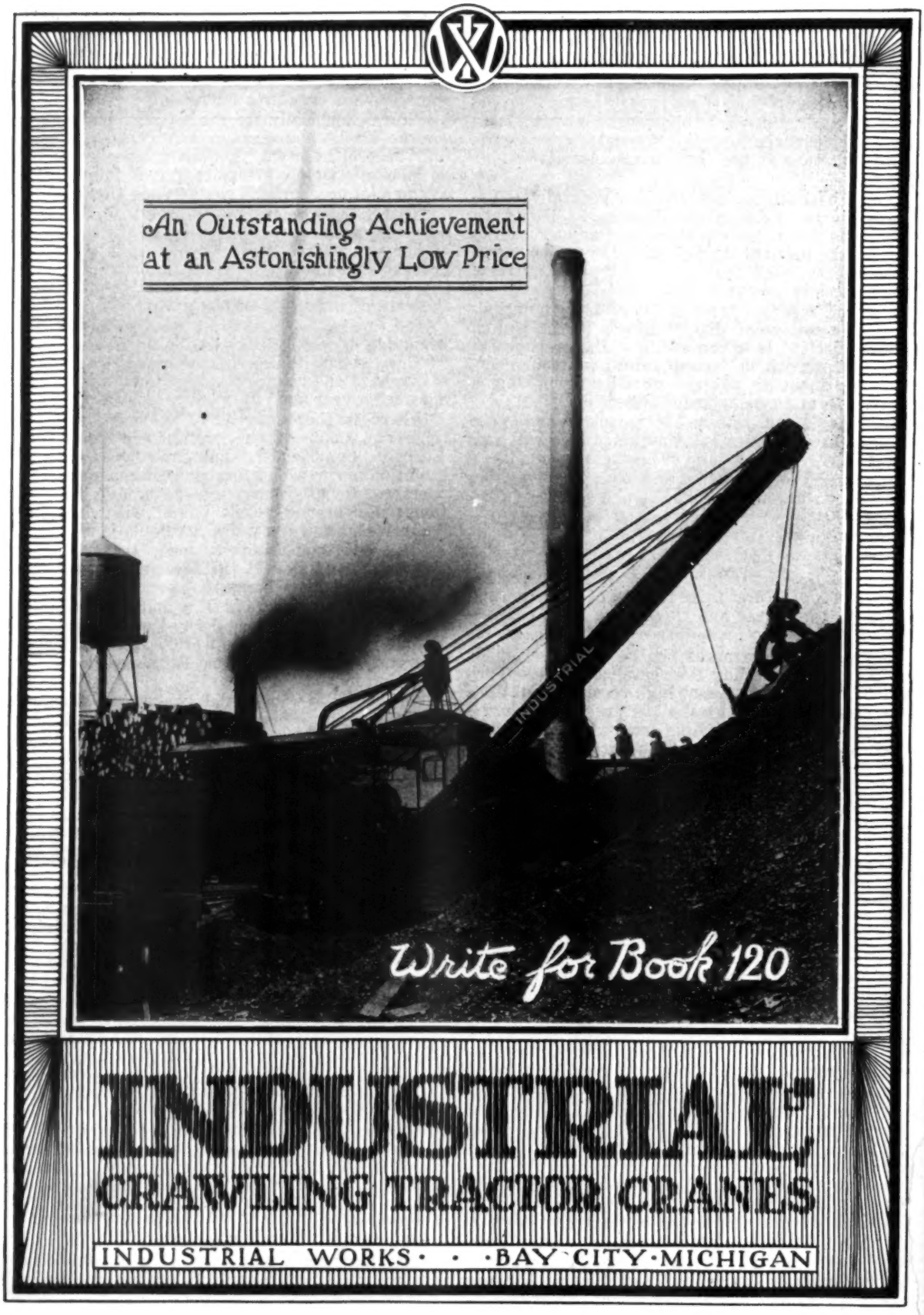
To repeat, these are not "rotten" business conditions! What has caused business men to reply so caustically, cryptically and disgustedly to the query, "How's business?" with the answer "rotten!" is just this: Vanishing profits!

Commodity prices in the past eighten months have been reduced to about their irreducible minimum. With decline of price every producer sought to cut expenses by increased production. Increased production plus increased imports have conspired to induce buyers to view the accumulating commodity surpluses with alarm. Fearing further severe cuts in commodity prices, consumers and retailers and distributors have curtailed purchases, particularly future commitments. This in turn has occasioned a slow-down in orders and must in turn produce a slow-down in production.

Facing such a situation, with certainty of shut-down of productive capacity, with a consequent advance in cost and a loss of profit, and finding no other alternative, that is the reason that when one business man meets another he says, "How's business?" and the answer is

"Rotten!"

But business is not unsound. The fundamental factors will assert themselves and change the entire situation—in time.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Editorials

Savings Effected in the Industry

A VETERAN papermaker once remarked that a paper mill was the only place where a conveyor was used once and then discarded. The reference was, of course, to the water employed in the various mill operations, whether in a paper mill or a pulp mill. In order to manufacture one ton of paper, it is necessary to use in the conveyance of the fibers from beater to wire a total of something like 25,000 gallons of water.

Down to a comparatively recent period and with few notable exceptions, the water draining away from the Fourdrinier machine was allowed to flow into adjacent watercourses or sewer pipes, a limited proportion of escaping fibers being caught in save-alls and returned to the system. In isolated cases where water the conveyor was scarce or was sold in metered quantities, as in the case of some mills located at the seaboard, an elaborate system of filtering made it possible to use a considerable proportion of manufacturing water over and over again.

In the old days it was not alone the water that was wasted but a considerable proportion of manufacturing material as well, and the discharge of the combined mill effluent served to pollute streams and watercourses to such an extent that action was taken by State boards of health to prevent the discharge of mill wastes into running streams.

Partly on account of the demands of the State board of health, and to some extent influenced by Secretary of Commerce Herbert Hoover's studies in avoidable wastes in industry, several paper manufacturers in Ohio have gone vigorously to work to attack waste wherever found within their establishments. The movement for the prevention of avoidable waste in the paper industry is spreading all over the country and special studies of the subject are now being conducted at the United States Forest Products Laboratory.

The importance of the subject may be understood, especially by those who have not had their attention previously directed to it, by some results obtained in a western mill, details of which have reached us from a private source. By the use of special save-alls and settling tanks for the recovery of fibers and fillers great economies have been effected. In addition to an extraordinary saving of water which enabled the mill to shut down two of its three fresh water wells, this mill is recovering clay in the white water to so great an extent as to cut down their purchases of clay by two carloads a week. At the present price of English clay this represents a saving of about $1,000 a week. In another plant we have reports of daily savings of thirty-five tons of material where the total production of paper on two machines was 125 tons. In this instance—a plant in which much clay was used to load the sheet for special purposes—the mill was enabled to cut its clay furnish by 40 per cent.

Instances like the foregoing are being reported from different parts of the country. They serve to emphasize the need for further study of avoidable wastes in various papermaking operations. Great economies and increased efficiency are sure to follow wherever measures are taken to prevent avoidable losses in manufacturing operations.

Our New Eastern Office

THE Eastern Office of THE PAPER INDUSTRY, *located for some time past at 53 Park Place, New York City, has been removed to new quarters at 18 East 41st Street, on the same floor with the American Paper and Pulp Association.*

The removal to a more centrally located and commodious office has been made necessary by expanding business and the appointment of a resident associate editor, Mr. Thomas J. Keenan, who will establish direct contacts with the pulp and paper mills in the eastern territory and report developments there and in the metropolitan district. The telephone number is now Murray Hill 3170.

Two Important Problems

SAVE the Forests—If riot or invasion should sweep this country, killing unprotected settlers, plundering banks and people's savings, and by destroying the basis of commercial enterprise should reduce our income by hundreds of millions every year, the catastrophe would startle the world.

If this disaster should threaten to occur the following year and every year afterwards, each year taking a billion dollars from our people, paralyzing our industry, threatening future famine and worse still, destroying by millions of acres the very productivity of our lands, the situation would be unbearable. It would dominate every mind and all else would be forgotten in preparation for the defense against such happenings.

Though less spectacular, the destruction of our forests by fire is as real as a riot or invasion, for this bill every year is something over five hundred million dollars.

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That the nation may be stimulated to a better understanding and a keener appreciation of the role which forests play in every branch of American life, President Coolidge has wisely brought the meaning of what has heretofore been observed as Forest Protection Week, which has just passed, the week between April 27 and May 3, to us.

Raw material for our mills, wood for our homes, water for our cities, farms and factories, wild life in our states, outdoor recreation for our people and a better country for our future generations. These are some of the larger interests represented by what is now known as the American Forest Week.

The President appeals to individuals and organizations everywhere for active help in arousing the nation to the need of forest protection and reforestation. We have pointed out in these columns from time to time the great need of reforestation and fire protection for the forests that are now standing. Many people seem to think that this is a problem that does not concern them personally, but the effects of deforestation are today reaching far beyond the single problem of a national timber supply. They strike at the very heart of national conservation.

THIS or THIS

What Shall We Have Tomorrow?

In our industry the forests are the basis of our hopes for the future of a sufficient amount of raw material. If half a billion dollars' worth of forests are destroyed every year by fire and there is no real program of progression along the lines of reforestation, it can easily be seen that in a few years we will not have any forests.

In traveling over the country last summer the writer saw thousands of acres that looked like the second picture herewith shown and in making inquiry as to the cause of most of these fires, it was learned that most of them are started intentionally or by criminal negligence. Some states have rather stringent laws on the subject of starting fires to forest, while other states have no laws at all. The paper industry and the other wood using industries should so thoroughly rouse the whole nation on this subject that it would be considered a very serious offense to start a fire in any forest.

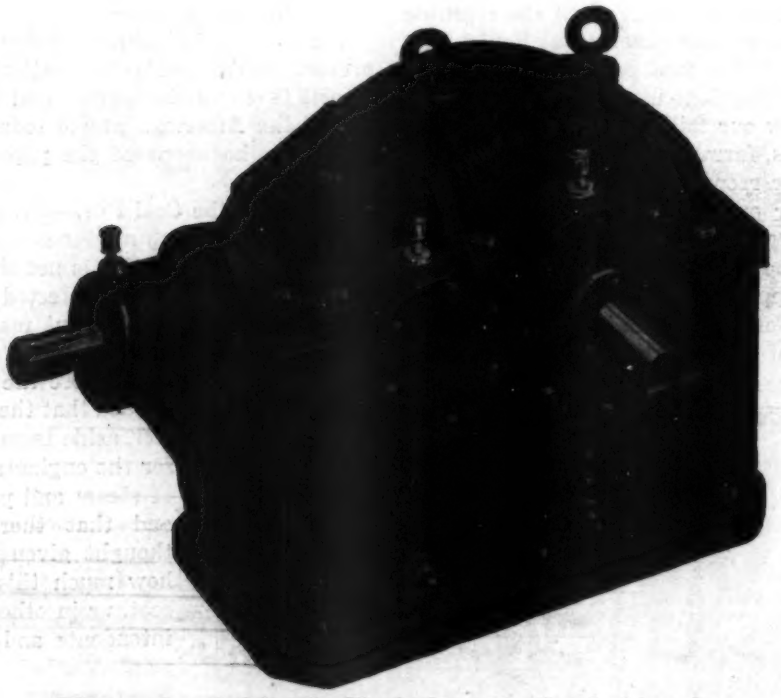
We believe the subject of fire prevention in the present forest and reforestation to build up new forests is one of the biggest and most vital subjects before the American people today, and this is certainly the backbone of the paper industry for the future.

Saving on the Coal Pile.—Saving the present forests and building up new ones is of vital importance to the industry, but this is not the only place where saving can and could be effected around a paper or pulp mill. The writer spent many years traveling among the paper and pulp mills and up to the time just before the late war it always seemed that the one important subject, aside from raw materials, was for the engineer to furnish enough of steam and power for the plant, and that there was very little thought given to the question of how much this power and steam cost, or in other words, the superintendents and others in the mill wanted sufficient power and steam, but there was little thought given as to whether this could be furnished at a less cost than was being done.

Since the war, with coal costing considerably more than it did before that time, many manufacturers are beginning to realize that considerable money can be saved on the coal pile by the installation of new appliances and by making changes in their present plant, which though costing considerable money in some cases, would no doubt many times pay for the expenditures in savings made.

There are a hundred and one appliances on the market to help to cut down the costs of making power and steam. Many of these could be added to practically every power plant in every paper and pulp mill in the United States and Canada with beneficial results. We would not advocate, of course, the buying of everything that is proposed for the saving of costs in making steam and power, but this question should be taken up intelligently, and we believe if the subject was gone over with an engineer that knows his business, that practically every power plant in every paper and pulp mill in the United States and Canada could reduce their power costs.

The next issue of this publication is going to be devoted to a large extent to helpful material along this line and we know that thorough reading of it and following some of the suggestions made will be beneficial to many of the manufacturers in our industry.



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THE PAPER INDUSTRY

REG. U. S. PAT. OFF.

Vol. 7 MAY, 1925 No. 2

How to Measure White Water Losses

By VANCE P. EDWARDES

Engineer in Forest Products, U. S. Forest Products Laboratory, Madison, Wis.

THERE is one aspect of paper mill operation which, though not recognized as a department and generally overlooked, succeeds in making its presence felt month after month on the balance sheet, but always on the wrong side. The economical use of water and the recovery of its solid content are of as great importance to the welfare of the mill as many other parts dignified with the name of departments.

Just as the metallurgical industries find it necessary to keep a constant check upon the loss of valuable metals in the furnace slags, so the paper mill operator should know his plant's daily discharge of white water and its valuable content. The accurate measurement of white water, however, offers difficulties which are sometimes hard to overcome. On the other hand there are features of the determination of the solid content which can be much simplified in certain cases. The information here presented has been compiled from a number of sources[1] (including personal experience), in the hope of rendering the methods of measurement more accessible.

The authorities are unanimous in declaring the weir one of the most accurate devices for measuring flowing water, and its use is therefore strongly recommended for paper mill work. The proper installation of a weir is not as simple a matter as it might seem at first glance, and many factors must be considered if an accurate record is desired.

For conciseness the following symbols are used throughout:

For all weirs:

H = Measured head, or difference in elevation between crest (lowest part) of weir and water surface upstream.

A = Area of section of channel of approach.

W = Width of the channel of approach.

P = Height of crest of weir above bottom of channel of approach.

Q = Discharge over weir in second-feet (i. e., cubic feet per second).

$V = \text{Mean velocity of approach} = \frac{Q}{A}$

g = Acceleration due to gravity.

$h = \text{Velocity head} = \frac{V^2}{2g}$

G = Depth of water upstream from the weir = P + H.

d = Area of section of channel of approach divided by the length of the weir, a factor used in correcting for velocity of stream.

For weirs with end contractions (i. e., weirs less than the full width of channel):

L′ = Measured length of weir.

L = Length of weir corrected for end contractions.

$d = \frac{A}{L}$ for any channel of approach and $\frac{WG}{L}$ for a rectangular channel of approach.

For weirs without end contractions ("suppressed" weirs):

L = Measured length of weir.

$d = \frac{A}{L} = G$ = Depth of water upstream from the weir.

CONVERSION TABLE

One second-foot = 86,400 cubic feet per 24 hours.

One second-foot = 448.83 U. S. gallons per minute.

One second-foot = 646,317 U. S. gallons per 24 hours.

One cubic foot per minute = 10,772 U. S. gallons per 24 hours.

[1] Much of the information has been taken from King's *Handbook of Hydraulics*. Other sources consulted are:
Trautwine's *Engineers' Packetbook.*
Kent's *Mechanical Engineers' Pocketbook.*
Mark's *Mechanical Engineers' Handbook.*
Peele's *Mining Engineers' Handbook.*

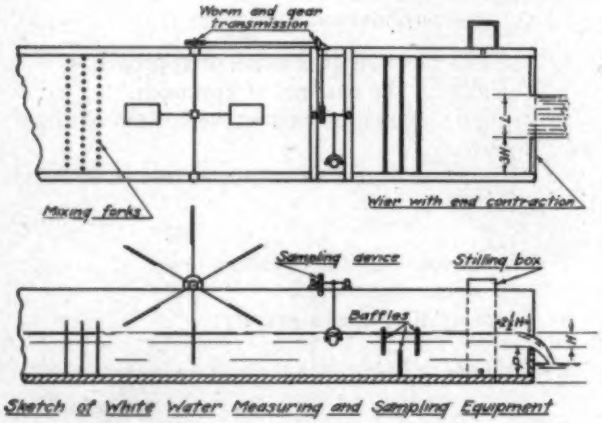
Conditions Governing the Choice of a Weir

Usually the quantity of water, or the limiting quantities if the rate fluctuates, may be determined approximately before beginning the measurement. The best weir for the purpose may then be selected, with careful consideration of the following important points:

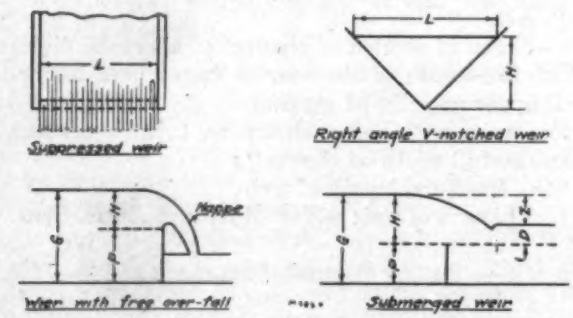
1—Owing to the tendency of the discharge or "nappe" to adhere to the down-stream face, weirs should not be used where the measured head is less than 0.2 feet.

2—For accuracy in measurement, the length of a rectangular weir should be at least three times the head.

3—The percentage of error in discharge resulting from a given error in measuring head decreases as



Sketch of White Water Measuring and Sampling Equipment



the head increases. Greater accuracy may therefore, be secured by selecting a weir of such dimensions as to insure discharge at the maximum head practicable, subject to the requirements of paragraphs 1, 2 and 3 above.

Right Angle V-Notch Weir—Right angle V-notch weirs are preferred to weirs of any other type for measuring widely fluctuating discharges. Theoretically they are the most accurate for volumes met with in paper mill work, but practical experience has nevertheless shown that the volumes indicated may be decidedly in error owing to the adherence of the nappe to the upper part of the weir notch. This is particularly true if the opening becomes at all slimy, as may easily happen in any mill, and the operation of the weir should be closely watched.

Probably the best formula for the V-notch weir is,

$$Q = 2.52\ H^{2.47} \qquad (1)$$

The weir should be carefully set so that the sides make equal angles with the horizontal.

In case it is desired to correct for velocity of approach, the formula

$$Q = 2.52\ H^{2.47}\left(1 + 0.23\frac{H^4}{A^2}\right) \qquad (2)$$

applies, but the correction is not generally considered necessary unless the velocity of approach exceeds 0.5 foot per second.

Rectangular Weirs—Probably the most accurate formula for rectangular weir discharge is

$$Q = 3.34\ LH^{1.47}\left(1 + 0.56\frac{H^2}{d^2}\right) \qquad (3)$$

for a weir without end contractions ("suppressed" weir). Where there are end contractions, L, the effective length, is obtained by the formula

$$L = L' - 0.2\ H \qquad (4)$$

where L′ is the measured length.

In formula (3) the term $3.34\ LH^{1.47}$ will give the discharges without the velocity of approach correction. The expression within the parenthesis is the factor correcting for the velocity of approach. The latter may be neglected under the same general rule applying to V-notch weirs, in which case the formula becomes

$$Q = 3.34\ LH^{1.47}, \qquad (5)$$

or more simply the "Francis formula"

$$Q = 3.33\ LH^{1.5} \qquad (6)$$

which is accurate within about 5%, may be used.

It is advisable to avoid the use of rectangular weirs with end contractions, though the length of weir between contractions, if used, should be at least 3 H, or more, if possible.

Submerged Weirs.—Mill conditions may be such that the installation of a weir with a free overfall is impossible. In such a case a submerged weir may be used. As is indicated in the figure, the level of the water down-stream from the weir is higher than the weir crest. The discharge of a submerged weir is not seriously reduced, and the same formula applies as is used for weirs with a free overfall, provided the depth of submersion of the weir crest below the down-stream level is not greater than 20 per cent of the head above the crest. The head of water below the weir to determine submersion should be measured sufficiently far down-stream to avoid the disturbance caused by the fall of the water.

Precautions for Accurate Use of Sharp-Crested Weirs.—In order to obtain the most accurate results from weir measurements, the following are some of the precautions to be observed and conditions to be fulfilled:

(1) The head (H) should be measured at a distance at least 2.5 H back of the weir.

(2) For the best results, H should be measured by means of a hook gauge in a well or stilling box connected by a small pipe to the channel. The box should be about one foot square and the pipe about ¾ inch in diameter. Where a recording level gauge is installed, it will be almost necessary to use a smaller inlet, say ⅜ inch, since otherwise the recording pen will "hunt," thus using the ink too rapidly and giving a broad band for the record rather than a line. The pipe will need frequent cleaning if reliable records are to be obtained. The box can be located either outside the sewer or in the stream, provided it is sufficiently far back of the weir so that it will not interfere with the flow. The head should be determined from the mean of ten observations taken at about one-minute intervals.

(3) The crest of the weir should be so constructed as to insure perfect contraction of the discharge into a smooth stream. This requires that the up-stream edge shall be sharp and smooth and that the crest shall be thin enough to prevent any tendency of the water to adhere to its top surface. A metal crest free from rust, with a sharp right-angled corner on the up-stream edge, a width of ⅛ inch, and beveled to the thickness of the metal on the lower face, should give satisfactory results. The up-stream face of the weir should be vertical, and for rectangular weirs the crest should be level.

(4) Care is necessary when H is less than 0.3 foot to prevent the nappe from adhering to the crest and the down-stream face of the weir. When H is 0.2 foot or less, it becomes very difficult to prevent such adherence, and the formula for sharp-crested weirs becomes unreliable. When thoroughly aerated, however, the nappe will spring clear of the edge if the width of the crest is not more than ½ H. With a rectangular weir, the result can be assured by installing a ½ inch pipe, extending from just under the edge of the nappe to any convenient point at the side, through which a sufficient amount of air will be drawn. The water surface on the down-stream side of the weir, however, should in this case be at least ½ H below the crest of the weir.

(5) No water should be allowed to leak past the ends of the weir or under it. For a permanent weir, special precautions should be taken to guard against such defects.

(6) In case the flow is turbulent before reaching the weir, it will be necessary to install baffles sufficiently far up-stream to render the flow smooth by the time it reaches the stilling box and weir crest.

RECOMMENDED WEIR DIMENSIONS

Discharge (Q) in second-feet	Head (in feet) for weirs of various lengths				Head (in feet) for right-angle V-notch weir
	1 foot	2 feet	5 feet	10 feet	
0.25	...	...	...	...	0.20
0.10	...	...	...	...	0.27
0.50	0.27	...	...	...	0.52
1.00	...	0.27	...	...	0.69
2.50	...	0.51	0.27	...	1.00
5.00	...	...	0.44	0.27	1.32
10.00	...	...	0.71	0.44	1.75
25.00	...	...	1.32	0.82	...

Other Means of Measuring Water Volumes

Unfortunately, it frequently happens that the sewers and the lines discharging into them are located in the most inaccessible places, the mill architect apparently working on the basis of "out of sight, out of mind." Under such conditions gauging the water volume is particularly difficult, and it may be necessary as a last resort to use other means than weirs.

The following are methods which have been used under various conditions for determining the flow of water:

Current meters
Pitot tubes
Floats
Traveling screens
Color methods
Gravimetric measurements
Volumetric measurements
Orifices
Meters
Chemical gauging

Gravimetric and volumetric methods of measuring water, which require the determination of the weight or volume of water flowing in a given time, are adapted primarily to experimental work in laboratories, or to the measurement of comparatively small quantities of water and need not be described here.

Velocity-area methods involve the determination of the mean velocity of the water, and with the cross-sectional area of the channel known the discharge equals the product of the two factors. The color and traveling screen methods provide for the determination of the mean velocity from a single observation. The current meter and Pitot tube give velocities in only one point in the cross-section at a time, and floats give the mean velocity in a limited area of the cross-section.

Before studying in detail the different methods of measurement, a knowledge of the distribution of velocities in the cross section of a channel is essential. The salient facts will be stated:

1—The maximum velocity occurs at a distance below the surface of about 5 to 25 per cent of the depth of the stream, the percentage increasing as the depth of the stream increases.

2—The mean velocity in a vertical, within a maximum error of about 3 per cent and an average error of 1 per cent, occurs at 0.6 depth.

3—The mean velocity in a vertical, within a maximum error of about 1 per cent and an average error

of zero, is given by the mean of the velocities at 0.2 depth and 0.8 depth.

4—The mean velocity in a vertical is from about 80 to 95 per cent of the surface velocity.

Current Meters.—The current meter is generally preferred for measuring velocity in open channels, and is used almost exclusively for rivers. It is not recommended for paper mill work, however. Several types of meters are on the market, having wheels of two general types. The Price, the Ott, and the Haskell meters are all extensively used in the United States.

Pitot Tubes.—Pitot tubes[2] are especially adapted to the measurement of velocities in pipes. They also may be used for measuring open-channel velocities that are too high to be conveniently measured with current meters. For any particular channel a plot of the velocities across the flow should be made in order to determine the proper coefficient. Once this is known, future readings need only be taken at the center and the mean velocity determined by using a coefficient, which will approximate 0.84.

Floats.—The velocity of a stream as determined by the travel of surface floats is apt to be greatly in error, as the actual stream velocity varies from 0.79 to 0.95 of that indicated at the surface. Rod floats can be used to good advantage in uniform open channels. They consist of hollow cylinders of tin weighted so as to stand vertically, and reaching nearly to the bottom of the channel. The mean velocity, V_m, in the vertical plane down which the rod floats with a velocity V_r is determined approximately by the formula

$$V_m = V_r\ (1.012 - 0.116\ d' \div d)$$

where d represents the total depth of the stream and d′ the depth below the bottom of the rod. d′ should not exceed 0.25 d.

About 100 feet of channel should be available for the observations. This method of measuring velocities should be used only to obtain an estimate of the volume in order that a proper weir may be selected.

Traveling Screen.—The traveling screen method is suitable only for open channels of very regular cross section. It requires quite elaborate preparation and will not be considered in the present connection.

Color Method.—For determining velocities of liquids in pipes and possibly in turbulent open channels, the color method is capable of yielding results of a high degree of accuracy.

The process consists in injecting a solution of coloring matter, commonly fluorescein, into the pipe and observing the time required for it to move a known distance. The coloring matter may be introduced at the intake of the pipe, or it can be injected by a force pump or gun into the pipe at any point. The second point of observation, which must be at the outlet of the pipe, should be at a distance of at least 200 times the mean travel per second. Time observations should be made at the instant the coloring matter is introduced and at the first and last appearance of the coloring matter at the second point of observation. The mean velocity is reckoned as the distance between the two points of observation divided by the mean of the two time intervals.

A very satisfactory gun for injecting the coloring matter can be made from a bicycle pump connected to the pipe by a short length of garden hose. A coupling and a ⅛ inch air cock are provided between the hose and the pipe. About one teaspoonful of flourescein dissolved in a pint of water is sufficient for ten injections in a pipe carrying up to six second-feet.

In making the test the coupling is opened and the solution poured into the garden hose. The coupling is then re-connected and the air valve between pipe and hose is opened so that the pressures are equalized. The air valve is closed and the pressure in the hose increased by pumping the gun. While noting the time to a second, the air cock is opened and almost immediately closed.

Comparison of the color method with very carefully constructed weir measurements shows that it is correct within about 3 per cent. The method has been modified by Professor C. M. Allen, Professor of Hydraulic Engineering, of Worcester Polytechnic Institute, by substituting for the colored solution a concentrated brine and determining the water velocity by means of an electric circuit properly connected to a galvanometer.

Orifices.—The satisfactory use of orifices is limited to measurements of flow of liquids under pressure, such as determining the capacity of a fire pump. It is not applicable to white water determinations.

Meters.—The Venturi meter is quite common equipment for measuring flow through large pipes, but its use in the field of white water measurement seems inadvisable.

Smaller meters of the type used in domestic water supply can very well handle pipe lines up to 6 inches in diameter with a delivery of approximately 118 cubic feet per minute, and will do very well for shower pipes, etc. Probably the best type of small meter is that in which a turbine or other rotating part is revolved by the flow of water. Such meters may be obtained from the following firms: Neptune Meter Co., 50 E. 42nd St., New York; Hersey Meter Co., Boston, Mass.; National Meter Co., 299 Broadway, New York; Worthington Pump & Machine Corp., 115 Broadway, New York; Buffalo Meter Co., Buffalo, New York.

Chemical Gauging.—This method consists of determining discharges by introducing a chemical at a known rate into flowing water, and determining the quantity of the chemical in unit volume at a section

[2] The design of a Pitot Tube can be found in any of the numerous engineers' handbooks.

far enough removed to insure a thorough mixing of the chemical with the water to be measured.

Let Q = the discharge in second feet.
W = pounds of salt introduced per second.
N = pounds of salt contained in one pound of water after thorough mixing.

$$\text{Then } \frac{W}{62.4\,Q} = N, \text{ or } Q = \frac{W}{62.4\,N}$$

Simple as is the principle embodied, the above formula is somewhat inconvenient to apply, owing to the several factors which enter into the determining of N. Before attempting to measure the actual discharge it will be necessary to make a preliminary investigation, in order to determine the proper place for taking samples of dosed stream water and the necessary time interval between the time of beginning dosing and of taking the sample. Chemical gauging is best suited to conditions of turbulent flow and probably can not be applied satisfactorily to sluggish flow. For further information on chemical gauging, the reader is referred to the following articles: Chem-hydrometry and precise turbine testing, by B. F. Grant. *Trans. Amer. Soc. Civ. Engr.*, vol. 80, p. 951. Verification of the Bazin weir formula by hydrochemical gauging, by F. A. Hagler, *Proc. Amer. Soc. Civ. Engr.*, Jan., 1918.

It sometimes happens that the discharge sewer of the mill is of some other shape than a rectangular flume. If it is a canal in earth, the obvious installation is a rectangular weir, but if it is a circular conduit, the solution is not simple and recourse must be had to tables. See King's Handbook of Hydraulics, p. 203.

Recording Devices

There are a number of water-level recording devices on the market, any one of which will be satisfactory for the purpose. It is recommended, however, that a recorder which produces a continuous record in ink be used. Such apparatus may be obtained from the following firms:

W. & L. E. Gurley, Troy, N. Y.
Julian P. Friez & Sons, Belfort Observatory, Baltimore, Md.
Leupold & Voelpel, 107 E. 70th St., Portland, Ore.
Bristol & Co., New York.
Foxboro & Co., Foxboro, Mass.
Bailey Meter Co., Cleveland, Ohio.

The types vary, but some general rules apply to all cases:

1.—In selecting a recording water level gauge a high degree of accuracy is of extreme importance. For a V-notch weir flowing 2.5 cubic feet per second, an error of 0.01 foot in measuring the head will introduce an error of 2.5 per cent in the discharge; and an error of 0.05 foot will increase the discharge error to 12.4 per cent. For the same flow, a rectangular weir 2 feet long will give quantities in error by 3.0 per cent and 14.7 per cent respectively, and in one 5 feet long 5.5 per cent and 27.3 per cent.

2.—The stilling box must be sufficiently large to eliminate surges, and the communicating hole must be as small as possible.

3.—To convert the readings of the level recorder to volumes, the rating of the channel for various heights of water can be determined. Then, if desired, an integrating meter showing the volume passed, can be attached to the water level recorder.

4.—A stationary gauge, graduated in feet and hundredths, should be provided to serve as a check upon the recorder. The zero on both the gauge and recorder should be level with the crest of the weir, and means should be provided to check variations.

5.—The water level recorder should be placed far enough up-stream from the crest of the weir to be beyond the curve taken by the water as it approaches the weir.

To determine volumes from level readings, instead of using a rating table made up from a rating curve, the scale of discharges may be taken directly from the rating curve and pasted on the leg of a transparent triangle. Then by fastening down the day's record as taken from the recorder and clamping a T-square or straight-edge along the datum line, the discharges can be read off directly on the triangle.[2]

Sampling White Water

A continuous sample is of as great importance as are continuous flow records. It can best be obtained by the use of a paddle wheel driving a small dipper which moves across the flow. The dipper may be either self-dumping or empty into the bucket through a hollow arm and shaft. It will be best if the dipper is made to travel through the white water stream quite rapidly and to complete the remainder of the trip at a very slow speed. This can be accomplished by the use of a ratchet and weight. A 1-inch pump may have to be used where the water level is considerably below the floor. The paddle wheel offers the advantage of varying the number of samples with the flow. Means must be provided to properly reduce the size of the sample for analysis. The latter point is of great importance.

In order to assure an even fibre distribution in the stream before sampling, it will be necessary to install mixing devices, as otherwise misleading results are sure to be obtained.

Determining the Amounts of Fiber and Filler in White Water

The standard method for determining the fiber and filler content is to filter about 50 c. c. of the white water through a tared filter paper or Gooch crucible, and to dry and weigh the combined fiber and filler. The precipitate is then ashed and the amount of filler ascertained. The determination can be somewhat

[2] See *Engineering News*, August, 1914, p. 458.

expedited by using a fluted filter paper, but suction is of no assistance, owing to the nature of the material. The results are usually expressed in pounds per thousand gallons. The fact that the analytical figures are obtained on an oven-dry basis must not be overlooked in making later calculations.

The quickest way, however, when little or no filler is present, is to use a centrifuge to throw the fiber to the bottom of a graduated glass tube. By a series of comparative tests, it is possible to draw a curve expressing the relationship between the amount of solid material thrown down and the pounds per thousand gallons. For this purpose a tube such as is used in the determination of water and basic sediment in oils is quite satisfactory, though a special tube with a cylindrical bottom rather than a cone offers some advantage, particularly when dealing with white water of high fiber content. For ordinary work at least, a 50 c. c. sample of white water should be used. Centrifuging is not adapted to fiber and filler mixtures and in these cases ashing, though slow, is the best procedure to follow. A centrifuge which has been found to give entire satisfaction for the purpose is known as the International—size 2, and is handled by the various laboratory supply houses.

It is most important that mills should keep a close check on the volume and solid content of white water —not at widely separated intervals, but continuously. Frequently, the mere fact that records are being kept will bring about an improvement in operation. In general, the investment required to place the "White Water Department" on a sound basis will return a far higher rate of interest than any other outlay made around the mill.

Foreman Training in the Paper Industry

Part II—How to Plan and Lead Foreman Training

By J. K. NOVINS

Author of "A Training Program for the Factory Foreman," "Foreman Training in Practice," "Manual of Practical Training for the Railroad Foreman," etc.

Securing Foremen's Co-operation for Effective Training

NO FOREMAN training program, no matter how well it is planned, will prove successful in the paper plant, unless some provision is made for the foremen's participation in the planning and conduct of the course. In other words, if it is co-operation the employer asks of the foremen, it must be active co-operation, and not purely a passive brand. If the co-operation is of the latter kind, it is a sign that the work is a failure. In the words of Frank Cushman, an experienced industrial educator, "there seems to be no mid-point between success and failure; either the work is highly successful or it falls flat."

This series is a manual on the subject of foreman training, and as such is replete with valuable suggestions for the installation of a foreman training course in the paper industry.

Part two contains five chapters, of which this article is the fourth. "Management Co-operation for Effective Training" will appear in the next issue.

The author of this series is available to answer any inquiries regarding any phase of foreman training on which the reader might wish to be enlightened.

What forms should this co-operation take, and what should the management expect of the foremen? By means of illustrations drawn from the actual experiences of many concerns where foremen training has proven peculiarly successful, we will attempt an answer to this highly significant question, with the qualification, however, that no concern can expect effective foremen's co-operation unless similar co-operation is proffered by the higher officials in the organization. The latter phase, studied by the writer, was productive of many excellent as well as interesting developments, which will be covered in another article.

Briefly, there are three ways in which the management of the paper plant can secure the co-operation of the foremen in developing a training program. First, the foreman is consulted by the management in the inauguration of a type of foremen training, and even given carte blanche to decide on the kind of training without the interference of the management. Second, the foreman is consulted at every step during the development of the course, as to the subjects to be discussed, the men who should discuss them, as to changes in the course and method of study, and as to interesting other foremen in the training. Third, the foremen should be given an opportunity to apply their training for the good of the organization, and to improve their own standing as employees.

Foremen's Part in Course Planning

The desired co-operation can be obtained by the management when it impresses on the minds of the

prospective foremen students that the future of foremen training in the plant will depend on the attitude taken and the interest shown by the foremen taking the initial course. Realizing the responsibility, the foremen will enter into the matter wholeheartedly.

The attitude of the progressive employers was recently expressed by the official of a large corporation which bears a reputation for liberal labor management and highly efficient production.

"The intimation that the foremen wanted something in the way of an improvement course came from them," this official said. "This company has never had much faith in superimposed schemes of any sort. Why not pass the whole thing along to the foremen, and find what they want, and then simply do our part in providing them the means of working out the thing which they want!"

In the case of this corporation no training program was formulated until after a request came from the foremen. With the request for a system of training, came the suggestion from the foremen that a definite plan be outlined at a mass meeting of the foremen. This was a sign for the corporation officials to act. As the corporation controlled a number of shops, a suggestion was immediately made that each shop appoint a foreman to form a committee of foremen. During the next two months this foremen's committee met repeatedly at the company's general offices.

A Foremen's Mass Meeting

"The original request of the foremen," the factory executive told the writer, in outlining the history of the company's foreman training program, "had come in the shape of a suggestion for a mass meeting of foremen of the Chicago and Milwaukee plants which would give the foremen an opportunity for a clearer interpretation of the company's attitude to the men under their direction, and would also enable them to keep their acts, thought and development in consonance with the expressed attitude of the company officers.

"The committee of eight foremen immediately realized that a truly scientific discharge of this important function would require much more than the originally planned 'annual dinner,' and therefore, encouraged directly by the officers of the company, they began the development of a foremen's development course."

At a mass meeting of the foremen this committee presented its report. In its report the committee suggested that as their members had been arbitrarily chosen by each superintendent they felt it would be more in keeping with the general spirit of company policy to substitute for themselves a committee chosen directly by the foremen.

"This suggestion," the executive further related, "of course was accepted, and immediately the foremen at each plant were requested to select their own local plant committee on foremen's development work, the chairman of each local plant committee to serve as a member of the general committee of representatives from all plants."

Work of Foremen's Committee

"It was at once discovered there would be a large amount of scientific work connected with the enterprise. But a few of the eight members had time for this work, and they requested the management to appoint secretaries who could be spared from regular work at times to assist them, and this was put into effect. In all but one plant, these secretaries were chosen from the group of foremen. The general committee voted to make these secretaries regular voting members of the general committee. Their reason for so doing probably was that the secretaries were actively employed in working out the plan, and consequently better informed about it than were the regular elected members. In this manner the general committee became a representative committee of sixteen.

"At the request of this general committee, the employment manager of the West Pullman plant was appointed executive secretary of the committee. While this secretary was a member of the Industrial Relations Department and functioned largely as the direct representative of the executive officers of the company, his appointment to the position came wholly at the request of the foremen themselves. He had no vote in the committee; he was simply to consult and advise with the committee at all times.

"The committee of sixteen met once a month. It drew up a general plan of the course, which, when completed, was presented at the respective plants to the entire group of foremen in those factories, and merged, with some minor changes suggested by the various groups."

This plan, with modifications, is followed by other concerns. The mass meeting feature has been employed by Nekoosa-Edwards Paper Company, Port Edwards, Wisconsin, in a somewhat different way—the company had already arranged for instruction in the form of classes conducted by field representatives of the Extension Division of Wisconsin University, organized and conducted with the co-operation of a committee representing the Nekoosa-Edwards Paper Company.

"To start these classes," Mr. F. H. Rosebush, of the Department of Industrial Relations of the company, told the writer, "the company held a sort of mass meeting of the men and at these meetings the outline of the courses were put before them and were discussed in rather an informal way. Later the foremen and superintendents canvassed the men in their departments and helped to sign them up for the work."

A Cabinet of Foremen

It is not enough to consult the foremen in the inauguration of a training course; in most progressive

plants the foremen are consulted at every step in the development of the training on such matters as the choice of topics, the time of holding classes or conferences, the picking of lecturers and instructors and the application of the instruction to increased plant efficiency. In one middle-west factory this is accomplished by a foremen's cabinet, composed of a half-dozen men who have shown the greatest interest in the subject of foremen training. The cabinet meets weekly with the director of training and a representative of the Employment Department to discuss with them the subjects which in their judgment ought to make up the course.

"The men bring to the cabinet meetings," said the company's educational director, "the problems which they have encountered in the mill during the week, and the cabinet undertakes to sift out the points which are worth the consideration of the entire class. They also undertake, with the help of the class instructor, to organize these points so that that they may be best put over at the class hour.

"This cabinet is not a fixed committee. New blood is being constantly added by bringing in new foremen who have shown by their participation in the discussion in the class that they really have ideas of their own which are worth while for all to discuss.

"To keep the cabinet from becoming too large, names are being constantly dropped from the list as new ones are added, and everyone understands that his service in the cabinet is but temporary so that there are no hard feelings."

The foremen's cabinet corresponds essentially to the program committee worked out in some plants. This committee gets together beforehand and outlines certain topics in which the bulk of the plant foremen are interested. How a program committee operates is explained by Mr. Benjamin E. Mallary, and the explanation is drawn from his experience in foreman training as an official of the Dept. of Industrial Education of the Cleveland Board of Education.

How Program Committee Works

"A very successful course of study was worked out by the foremen of a certain industry," Mr. Mallary wrote some time ago. "Each foreman presented a long list of his own problems, those which came up almost daily in his department. In all, there were about seventy-five different problems presented. These were classified under different subject headings by a committee of the foremen under the leadership of the instructor. After such classification it was possible to arrange a schedule for discussion lasting over several months. This plan possessed several ideal features. The foremen did most of the work themselves. None could deny its practicability."

However, such plans, spectacular as they may seem, will not go far unless the foremen are made to realize throughout that they are actually benefiting by the instruction, both by increasing their individual efficiency and bettering their condition as company employees. This is the responsibility objective that any well founded foreman training program must aim for.

Giving Foremen-Students Responsibility

If the company thinks seriously enough of spending time and money in training its foremen, the training program should be taken seriously by all concerned—it should not deteriorate into a "play-school" proposition. If the training increases the foremen's knowledge and sharpens their executive judgment, then these foremen should be permitted the opportunity to make use of this increased knowledge and sharpened judgment. The inevitable result will be that the men take a keen interest in the training offered them.

As to how the foremen are to make immediate use of this instruction is a matter for the plant executives to decide, depending, of course, on conditions in the plant and the particular problems facing it.

There are times when pressing plant problems are solved at foremen's conferences, such as the matter of hiring and firing of labor, as is exemplified by the experience of a large southern concern.

"If reductions or increases are to be made in the working force," an official of this company informed the writer, "it is determined in these conferences just what men are to be laid off and what men employed respectively. In either of these cases, but more particularly the former, the advice of the service superintendent is sought since all payroll exits are approved by him. When an increase is made in the working force, the service superintendent often seeks the advice of a foreman or departmental superintendent in selecting men for the various jobs. Questions of promotion and demotion are handled in the same manner."

There are some who question the advisability of turning a purely educational conference into an executive conference such as this official makes reference to, on the theory that such tactics would tend to deviate from the main purpose of foreman training. As a rule, leaders of foremen's conferences abstain from making company decisions at the conferences, or suggesting that the men vote on specific company executive policies. But the practice here introduced is simply an example of what can be accomplished by working with a group of foremen along educational lines. A lot depends on conditions. During a sudden change in labor conditions, the foremen's conference can perhaps be used as a vehicle for accomplishing a sudden change in organization, and the company would be assured of better results than if the foremen had been consulted individually. That the foremen conferences have improved the executive judgment of the foremen is proven by the fact that plant executives will favor the foremen who have taken the training when matters of promotion to higher executive positions come up.

The Paper Industry, 1860-1870

By F. G. CRAWFORD
Professor of Political Science, Syracuse University

This is the concluding chapter of Professor Crawford's historical narrative. The first half was published in the previous issue.

Period Following the War

THE last five years of the decade are not as spectacular as the period during the war. Profits had been very good for four years and numbers of men had rushed into the business. It was estimated that more mills were put into operation in 1864-65-66 than in the twelve years previous.[73] A paper mill at South Hadley, Mass., declared a dividend of 100 per cent in 1864 and 120 per cent the next year.[74] Examination of the returns of the income tax paid by persons and firms interested in the manufacture of paper in one district during 1865-1866 showed one corporation reporting an income of $178,000, ten individuals with a total of $314,000, and other large incomes.[75]

The extent to which the industry grew in volume during the war is shown by the report of the tax paid by the industry as a whole. This tax was 3 per cent on the manufactured product.[76]

1863.....	$ 311,434	1866.....	$1,172,114
1864.....	686,675	1867.....	743,077
1865.....	1,082,475	1868.....	340,398

In 1866, which was the high point of the industry, there were 750 mills in the country, manufacturing 135,000 tons of paper.[77] As paper stock became available, every mill ran to full capacity and soon the market was overstocked. Prices fell in 1867 to 13c for newspapers as against 20-28c of two years before,[78] and the manufactured product became almost a drug on the market. Many mills were abandoned and sold for less than the cost of construction.[79] The paper industry was much like the wool industry in the reaction which came in this post-bellum period. The new processes and the demand for manufactured goods attracted much capital to these businesses, and the increased production was disastrous to peace-time conditions.

[73] Special Commissioner Internal Revenue, *Report*, 1869, p. CVII.
[74] Munsell, p. 179.
[75] Special Commissioner Internal Revenue, *Report*, 1866, p. 69.
[76] Harry E. Smith, *The United States Federal Internal Revenue Tax*, 1861-1871 (New York, 1914), p. 332.
[77] *American Artisan*, November 21, 1866.
[78] Special Commissioner Internal Revenue, *Report*, 1867, p. 27. Davis, p. 62.
[79] Special Commissioner Internal Revenue, *Report*, 1869, p. CVII.

The paper industry was burdened until 1868 with the internal revenue tax on the paper, chemicals, ink, and the finished book. This burden made the return to old conditions uncertain. Labor had advanced and was unsettled. Importations were increasing, and with these situations to combat, the papermaker was not in a satisfactory condition. He could only take the lean years in exchange for the period of profits that he had enjoyed during the war.

The decrease in the price of print paper developed the opposite situation to the one existing in 1862-64. Newspapers began to spring into existence. Many penny sheets were started, and the loss in numbers due to the hard times of the war was made up in the second half of the decade.[80] The price of waste paper and old rags declined rapidly to ½c per pound for paper, and 1½c for cotton rags.[81]

The condition of affairs among the papermakers did not improve and in 1869 a convention was held in New England, where it was decided to cut production of each plant 25 per cent, in view of the distressed condition of the business.[82]

The mills, which in 1866 numbered 750, were returned by the census of 1870 as 684, with a total product of $51,000,000. The industry was concentrated as in 1860 in Massachusetts, Connecticut, New York and Pennsylvania.

The Search for New Papermaking Material

The paper industry, as its history is traced through the period of the war, does not present any particular new points of view, unless we consider the introduction of new processes, new machinery, the substitution of new raw materials for cotton rags, the varied uses of paper, and the spread of the industry to the South and West. Allusion has been made to the substitution of new raw materials for cotton rags. The idea of using these substitutes was the work of the ante-bellum period, but it was the stress of war conditions that forced them to a trial, discarded many as impracticable, and accepted others as an important part of the industry. Both in America and Europe paper had been made from various cheap materials, but inducements were lacking for capital to push them extensively. There was no promise of large returns, the supply of cotton rags being sufficient for every purpose to produce a satisfactory grade of paper.

To be a successful papermaking material, a com-

[80] *Commercial Bulletin*, September 11, 1869.
[81] See table.
[82] Special Commissioner of Internal Revenue, *Report*, 1869, p. CVI.

GOODE'S SERIES OF BASE MAPS AND GRAPHS. THE UNITED STATES OF AMERICA, ON THE CONIC PROJECTION. NO.110

For class use in Geography, History, Civics, Economics, etc. Prepared by J. Paul Goode. Published by The University of Chicago Press, Chicago, Ill.
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modity must contain a relatively high amount of cellulose. Cotton contains 91.35 per cent, with linen ranking next with 81.99 per cent. The commodities which will be discussed have a high percentage of cellulose or were very low in price.

Straw had been used by paper mills in the 1850's with little success, but the process was greatly improved toward the end of the century. A superior straw process was patented in 1857, and the manufacture of paper was begun at Fort Edward, N. Y., in 1859. This process used a 4 per cent solution of caustic soda at a temperature of 300° F.[83] In 1863, a joint stock company was organized with a mill at Batavia, Ill., in which straw was to be used for paper stock.[84] Straw came to be recognized as a material from which heavy wrapping paper could be successfully made.

Sorghum was another material used to some extent, particularly in Illinois, where a mill was started in 1862.[85] In 1863, two mills were using this product as a raw material, and the Chicago Tribune was printed on paper made from one-fourth sorghum.[86] This same product was used in a mill at Perrysville, Ohio, for the making of wrapping paper. Sorghum was not a success in the manufacture of fine paper, but was available for the making of the coarser grades.

Corn husks had been used in Europe for many years as a successful paper material. A German who came to America in 1862 took out a patent for the use of this material, but corn husks were never used to any considerable extent.[87] Woolen rags were never a success, as it was impossible to bleach them, but they could be mixed with other materials to a limited extent and used in the manufacture of coarse paper.

Western Papermakers Investigate Wood Pulp Question

The Northwestern Paper Makers' Association met in Chicago on December 23, 1862, and took up the whole question of a substitute for cotton rags. At this meeting samples of pulp made from straw, corn husks, sorghum and basswood were shown.[88] In the states of the West, where the old processes had not become firmly planted, it was easy to try out new schemes in the endeavor to find a practical substitute for cotton. In 1864, the Western Association authorized its directors to investigate the wood pulp question and, if feasible, to prepare a plan for a mill.[89] A company was organized in Brooklyn, N. Y., for the manufacture of paper from bamboo secured from the island of Jamaica. Bamboo was shipped to New York, but the mill was not successful.[90]

In 1862, brown paper was made from wild flag growing on the lowlands. Sedge grass also made a fair quality of paper.[91] Reeds were used in Wilmington, N. C., and the paper was of good grade. The use of jute or jute hemp, to be mixed with cotton, was tried and was especially successful in the making of heavy brown wrapping paper.[92] Over one hundred materials were experimented upon, and paper of a medium quality was made from practically all of them. Many varieties of fibre plant were included in this list. Waste products and many kinds of wood were suggested. The choice of a substitute put forward depended entirely upon the availability of the commodity in that community, whether it could be produced in quantities, and the cost of production. The western states proposed wood, the prairie states corn stalks, jute and sorghum, and the coast states flag and sedge grass.

Soda Process Introduced

The most important of all materials suggested was wood, and it is from wood that the great bulk of paper is made today. The process had been thought out earlier and a patent for the soda-fibre process had been taken out in 1854, but the first plant did not go into operation until 1863, when the real need for paper made it possible for this process to be used.[93] With the soda process, the woods which were used were cut up into chips by a machine and carried to digesters, where a soda solution was added. Steam was then admitted into the digesters and the digesters operated under a pressure of 115 pounds for a period of five hours.[94] This process was successful and paper of a good quality was made. The mills at Rogers Ford, Pa., made two tons per day. The paper made was sold to the Boston Journal and was 86 per cent wood pulp. This paper announced that they were wholly pleased with the wood-pulp paper and were using it for their entire edition.[95] The cost of manufacture was 6 cents per pound, but the regular market price was secured. A mill in Windsor, Conn., in 1863 used wood pulp as paper stock, and the New York Times offered to try to use the product. In many mills one-third to one-half cotton rags were mixed with the wood pulp, making a satisfactory product. The paper made from wood was introduced not without some little trouble. Publishers were skeptical and afraid that it would ruin their type. The Boston Herald was sold a consignment by deception and was so well pleased that they declared they would use no other kind.[96] The president of the American Paper

[83] Chauncey M. Depew, Ed., *100 Years of American Commerce* (New York, 1895), I, p. 305.
[84] *Commercial Bulletin*, December 13, 1862.
[85] Ibid., November 22, 1862.
[86] Ibid., January 3, 1862.
[87] *Commercial Bulletin*, January 29, 1863; June 20, 1863.
[88] Ibid., January 3, 1863.
[89] Ibid., August 19, 1864.
[90] *American Artisan*, September 27, 1865.
[91] *Leslie's Weekly*, December 16, 1862.
[92] *Frank Leslie's Weekly*, August 17, 1866.
[93] Census of 1900, Vol. IX, Pt. III, p. 1026.
[94] Davis, p. 246.
[95] *Commercial Bulletin*, January 24, 1863. Munsell, p. 169.
[96] Davis, p. 59.

Makers' Association testified in 1882 that it was with the greatest difficulty that wood paper was introduced on the market,[97] and newspapers in some cases refused to buy from papermakers who used wood pulp. The attitude of the newspapers was not long lived, because pressing needs made it imperative that new products be used.

The largest wood pulp and paper mill in the world was the mill of the American Wood Pulp Company, at Mayahunk, Pa., which was formally opened April 12, 1866, in the presence of a large gathering of notables.[98] The plant covered ten acres and produced about twelve tons daily. Paper mills were close at hand and the pulp was at once made into print paper. The process had been greatly improved and perfected by this corporation and was commercially a success. The paper made was 80 per cent wood, with straw or cotton rags for the remainder.[99] The fault of this soda process lay in the cost of the chemicals. It was difficult to recover the caustic alkali, and in some mills the waste alkali was used in soapmaking, but at Mayahunk 85 per cent was recovered and reused.[100] The construction of equipment for the utilization of this waste alkali was one of the great problems in the development of the soda process. The percentage of recovery of the mill at Mayahunk was remarkable as compared with other mills of that period. This plant was incorporated for $1,000,000 and was an example of large capital going into a new industry.

Invention of Sulphite Process

The second wood process was the use of sulphite, which was patented in 1867 and today is used to a large extent for the making of paper pulp. This is an American invention. Spruce is desired, although other woods can be used successfully. The action of sulphite acid dissolves all the soluble material and leaves only the cellulose.[101] In this process the bark must be removed, and in this period the knots were taken out as far as possible. This is no longer the case because of the labor involved in their removal.

Use of Groundwood Established

The third method used in this period was the mechanical process, which was the most economical of all devised. The greatest number of pounds of paper pulp could be made from a cord of wood by the mechanical method because of the nature of the process. The wood grinder was invented by Kellar in Germany in 1844, was sold to Henry Voelter's Sons, and after many improvements was patented in the United States, August 10, 1858,[102] but did not come into actual use until 1867, when a grinder was established at Stockbridge, Mass., by Alberto Pagenstecher.[103] This process was popular, cheap, and considered very efficient at the time, as many different kinds of wood could be used. A cheaper grade of paper was made by this process, but demand made it readily salable.

The three processes described in connection with the use of wood for paper pulp have been of the greatest importance in the history of this industry. The use of wood is responsible for the growth of newspapers and the periodical literature of all kinds at a price within the reach of all the people of the United States. Print paper never approximated the antebellum prices and in 1920 sold at 4½c per pound. These inventions and processes stand out as one of the great contributions of the war. They would have come without the stress of war conditions, but were hastened ten, possibly fifteen years, by that struggle.

Development of Paper as Substitutes

With these new processes there came a corresponding increase in the number of machines that were invented. In the decade seventeen wood pulp and fifty papermaking machines were devised. For bleaching pulp thirty-six new patents were issued.

The scarcity of cotton spread to many phases of life other than the paper industry. The shortness of the supply was seriously felt in many lines and attempts were made to find substitutes. Paper was used to a large extent to supply this need. These substitutions in many cases were permanent when paper was found to be so serviceable. A satisfactory paper roofing to cover hospitals and other government buildings was made at Mayahunk, Pa.[104] This was the beginning of a great industry that has supplanted, in many cases, the use of shingles and slate as a roof covering. Paper was used in the making of hats in Massachusetts, being made to resemble felt.[105] It was used for book covers, the old cloth coverings being discarded. A product was devised which looked like leather, made entirely from paper and at a price 50 per cent lower than real leather.[106] This was the beginning of the imitation of leather for many purposes. Paper pipe was made, paper molds for jell, and one mill in Dalton, Mass., manufactured paper belting.[107] The American Papier Mache Manufacturing Company, at Greenpoint, L. I., made pails, pans, etc., from paper, an acid treatment rendering them impervious to water.[108] Other uses for paper were in the making of boxes, buttons, and the packing for engines.

Paper car wheels were devised and proved very successful. A Frenchman invented a paper coffin, which was highly recommended.[109] Paper boats were at-

[97] Tariff Commission, *Report*, 1882, Vol. I.
[98] *Frank Leslie's Weekly*, April 28, 1866.
[99] *American Artisan*, April 25, 1866; April 18, 1866.
[100] Ibid., April 25, 1866.
[101] Davis, p. 263.
[102] Ibid., p. 57.
[103] Census of 1900, Vol. IX, Pt. III, p. 1024.
Depew, I, p. 306, *Commercial Bulletin*, September 5, 1868.
[104] *Commercial Bulletin*, May 9, 1863.
[105] Ibid., May 9, 1863.
[106] Ibid., January 10, 1863.
[107] Munsell, p. 172.
[108] *American Artisan*, February 4, 1867; Ibid., February 5, 1868.
[109] Munsell, p. 187.

tempted and many other things which did not prove successful.[110] In general, the result of this mania of substitution was the manufacture of many articles which were of permanent value. The use of paper in boots and shoes, at first a device of the government contractors, was later recognized in the making of cheap footwear.[111]

The most important development was the coming of paper bags and boxes into general use, and the making of them in large quantities. Machines were not used with much success before 1855, but in 1857 a machine was invented which was successful.[112] The Census of 1870 reported thirty-nine establishments making bags with a total product of $1,483,963. The paper flour sack was also made and used.[113]

The envelope folding machine was first used in the late forties, was improved in the next decade, and further developed in the Civil War period. It folded, gummed and counted the envelopes as they passed through the machine.[114]

At the end of the decade the question was not of what paper could be made, but rather what could be made of paper. This product was entering into many fields. The paper industry marks the beginning of an age of substitution in many lines and well illustrates this tendency.

One of the most important substitutions was in the collar and cuff business, and the paper shirt bosom can be included with these two articles. They were a fad at first, but later became an article of utility. The price was low, so that all classes could wear them, and they were easily sold. The first patent on paper collars was taken out in 1854, which was for a collar of paper and muslin combined. The patent fell into the hands of W. E. Lockwood, who organized the Union Paper Collar Company and claimed a monopoly of the business.[115] Sales greatly increased and many new mills were built. One mill at Springfield, Mass., had a capacity of 20,000 per day.[116] A machine was soon devised which stamped on the collar an imitation of stitching and thus gave to them the appearance of linen.[117] A machine was put into use in 1866 which had a speed of two collars per minute, performing all the operations at one time and saving the work of thirty-six hands.[118] In 1870 there were thirty-three plants manufacturing collars and cuffs to the value of $3,000,000, with factories located in New York and Massachusetts. Advertisements for these articles appeared in every paper and the newspapers recommended them highly. Harpers Weekly said, "Paper garments threaten to displace cotton and woolen fabrics one of these days."[119] The industry supplied a real need. The paper collar, cuffs and shirt bosom furnished a complete outfit to the village youth and went well with his ready-made suit and factory-made shoes.

One of the interesting developments of the industry was the invention of safety paper, both as a means for preventing counterfeiting and also to designate the denomination of bills. Many processes were patented. One patent issued in 1863 provided for sheets to be formed of several layers. The middle layer was to be of an easily destructible color so that the chemicals which removed the writing would at the same time destroy the color. L. W. Crane, of Ballston Spa, N. Y., invented a machine in 1867 by which threads of gutta percha were run into bank-note paper in the course of the manufacture, whereby the printing became indelible and could not be counterfeited. To designate the denomination of paper money, the application of metal in foil or in powder was made to indicate the character of each bank note. Another process provided for continuous lines of fibrous material to be worked into the paper so that if they were withdrawn the surface would be destroyed. The threads were to be of different colors to designate values and thus prevent the raising of bills.

Growth of Industry in the West

In 1860, the paper industry was located preponderantly east of the Alleghanies, 90 per cent of the total product coming from the New England and the Middle Atlantic States. Iowa alone was represented west of the Mississippi, having one mill with a product of $17,000.[120] During the decade the western states took up the industry extensively. Wisconsin developed the paper business and, although at the start cotton rags were used, the real progress came when the natural resources of the state were utilized. The development of mills at Neenah and Appleton dates from the sixties, and their building was caused by the scarcity of paper. In the early sixties the publishers of Milwaukee incorporated a paper mill in order to handle their own paper problem.[121] With the development of wood as a raw material, the industry expanded and the mechanical process was first introduced at Appleton in 1871.[122] Across the Mississippi mills started in Missouri, Iowa, Colorado and Utah furnished the home supply of paper. On the Pacific coast a mill was built in California in 1857, which three years later produced 180 tons of paper, valued at $40,000.[123] California doubled its product in the decade, and in Oregon a mill was started making paper for home demand.[124] The industry had extended to the West in quantity, so that by 1870, 20

[110] *Harpers Weekly*, March 7, 1868.
[111] *American Artisan*, February 5, 1868.
[112] *Commercial Bulletin*, April 4, 1868.
[113] Ibid., August 22, 1868.
[114] *Paper Making*, Mass. Miscel. Pamphlets, 8, p. 67.
[115] *American Artisan*, October 3, 1866.
[116] *Commercial Bulletin*, July 20, 1863.
[117] Ibid., January 23, 1864.
[118] *Harpers Weekly*, March 17, 1866.
[119] Ibid., September 18, 1869.
[120] Census of 1860, *Manufactures*, p. CXXXI.
[121] Publius Lawson, *Paper Making in Wisconsin*, Wisconsin Historical Proceedings, *Report*, 1909, p. 273.
[122] Ibid., p. 276.
[123] Census of 1860, *Manufactures*, p. CXXXI.
[124] Commissioner of Agriculture, *Report*, 1869, p. 598.

per cent of the total product was made west of the Alleghenies, and many states were supplying their home demand.

The South's Set-back

In the South previous to the war there were twenty-four mills, making 31,000 tons of paper per year. This amount was not sufficient to supply the needs of the papers of the South, and the northern states and Europe furnished the remainder of the supply. The mills in the South were not favorably located, being centralized on the Atlantic coast. The scarcity of paper in the Gulf and western states of the Confederacy was felt very severely during the war. The New Orleans Picayune reduced its size one-half in 1861.[125] The Charleston, Savannah, Mobile and New Orleans papers raised prices 30 per cent.[126] By 1862 most of the country papers in Virginia had been discontinued, or were published irregularly.[127] An absolute lack of chemicals and bleaching material made the quality of the paper drop as the price steadily rose. By February, 1862, the price had doubled. Newspapers increased their rates. In Charleston papers charged as high as $20 a year.[128] Papers were printed on wall paper, wrapping paper, or any material available. In Georgia the Constitutionalist was forced to suspend publication when the Bath Paper Mills burned, all the mills in the South being monopolized to the fullest extent by other publications. Paper stock was plentiful, but the machinery to make pulp and paper was unobtainable.[129]

By the end of the war there were practically no mills and no papers in the Confederacy. The last half of the decade witnessed the rebuilding of the old mills and the introduction of new and improved machinery until, in 1870, eighteen mills had a product of $950,000. The location of the industry at the opening and close of the decade is shown by the following table:

	No. of Mills		Value of Product	
	1860	1870	1860	1870
New England	204	220	$10,502,000	$19,862,000
Middle States	273	327	7,908,000	21,179,000
Western States	53	101	2,042,000	7,219,000
Southern States	24	22	724,500	1,159,000
Pacific States	1	3	40,000	120,000

The paper industry through this decade expanded rapidly, developed new processes, and was engaged in making substitutes for other commodities. In 1850 the number of mills had been 485, with 7,500 operatives and a product of $11,000,000; in 1860, 600 mills with 11,000 operatives and a product of $23,500,000; in 1870, 684 mills with 18,000 operatives and a product of $51,000,000. The important fact in connection with this growth is the relative small increase in the number of mills as compared with the number of operatives and, even more significant, the value of the total product. The large corporation was becoming a factor in the industry.

The value of this period to the industry was very great; it marks the beginning of its true establishment, and prepared it for the greater expansion which came in the next fifty years.

Prices of Paper and Rags, 1862-1867; 1924.

(Prices in cents per pound)

	News paper	Writing paper	Book paper	Waste paper	White rags	Colored rags
Jan. 1862	8	15	.....	.....	.....	.....
Nov. 1862	17	15-25	.....	.....	.....	.....
Jan. 1863	20	30	.....	4-6	9-10	5-6
Nov. 1863	18	30-35	20-26	.....	.....	.....
Jan. 1864	17-18	32-40	20-22	.....	12	5-6
May 1864	20-21	35-40	24-30	.....	13-14	6-8
Nov. 1864	28	60	45	8	.....	.....
Jan. 1865	25	52	45	.....	.....	.....
June 1865	20-22	45-60	25-33	.....	.....	.....
Dec. 1866	17	.....	33	.....	.....	.....
Dec. 1867	13	.....	25	1½-1	9-10	1-2
Oct. 1924	3-4	14-30	7-10	½-3½	14-15	o-8

Waste in the Pulp and Paper Industry

By B. T. McBAIN
General Manager, Columbia River Paper Mills

SHALL I go back and head my stories Waste? It seems a shame that so many mills continue to waste, when by saving they could do so much for themselves.

I went into a sulphite mill not long ago and watched the stock go over the inclined flat screens. I say "the stock over the screens" advisedly for that was what was happening. Much good fibre was going to waste with the screenings, but that was not all the waste there was. I asked the sulphite superintendent how much he thought went into the river. He said he had saved the screenings for an hour at a time on different days and it amounted to an average of about 3 per cent. As this was smaller than the average in good mills and the amount going over the screens looked to me to be greatly in excess of what should be wasting, I arranged for a test before arranging for the installation of a screenings refiner and other equipment to save and utilize this valuable material. This test by actual measurement in a bin with drainer bottom showed nearer 8 per cent than 3 per cent. No one would believe it but on checking over the records of cooks made at the average production such a digester should produce, and comparing this total with the tons of paper made, the shrinkage over and above normal was very close to this figure.

More water was needed in the process of screening and this water was needed in a different place.

New diaphragms were needed for some of the screens.

Correct speeding of screens also helped.

[125] *Lowell Daily Citizen and News*, June 21, 1861.
[126] Ibid., January 11, 1862.
[127] Ibid., July 11, 1861.
[128] *Commercial Bulletin*, July 25, 1863.
[129] *Cincinnati Daily Commercial*, April 24, 1863.

These three items only saved about one-quarter of the waste, for the balance about 6 per cent was uncooked, or partly cooked and had to be rejected as No. 1 sulphite.

Changes in cooking corrected some of this, for very wet chips were being delivered to the digesters and the long time consumed in getting up to pressure and temperature greatly diluted the acid and by the time the chips were impregnated with the cooking acid much of its value as such had been lost.

This mill referred to is now getting strong pulp with better acid in less cooking time and with less than half the waste, and at much less cost of the finished product.

Eight per cent of shrinkage by waste of screenings cost that company a great deal of money. They are now saving these screenings, over one-half of it is No. 1 pulp and the other half for heavy wrappings. On a product of 2,000 tons per month, you can readily see they are now making nearer 100 tons more of pulp and piling up for other purposes 60 to 80 tons of very valuable by-product. In fact, in one season enough paper was made from these saved screenings to pay for the entire equipment with the profits from the by-product alone.

Mr. Superintendent—don't guess—test your waste in every department and know what it amounts to—then save it.

Pointers for the Engineer

By W. F. SCHAPHORST, M. E.

How Efficiencies Are Increasing

IT IS interesting to compare the efficiencies of steam engines of the old days with modern efficiencies. In the old days, back in the year 1600, it is said that Savery's engine required 100 pounds of coal per horse-power per hour. One hundred and fifty years later, Newcomen's engine sliced off 78 pounds —making it 22 pounds of coal per horse-power hour.

Now 325 years later than Savery, it is claimed that at the Lakeside station of the Wisconsin Electric Power Company in which pulverized fuel is used they are getting one kilowatt per hour from 15,988 B. T. U.'s. This is equivalent to about one pound of coal per horse-power per hour, depending upon the heat value of the coal. One kilowatt-hour is equal to 1.34 H. P. hours. The heat value of coal varies all the way from less than 10,000 to 15,000 B. T. U. per pound, depending largely upon the percentage of carbon it contains.

"Home-made" Specialties

ON LOOKING through a magazine the other day, nearly 50 years old, I was interested in reading an advertisement headed, "How to Make a Phonograph."

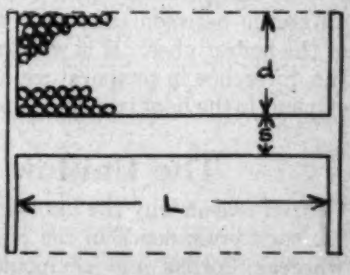
It struck me as unusually interesting because I have never heard of anyone trying to make a phonograph. We of the younger generations have always left that to the manufacturers of phonographs. However, on second thought I recall that when a boy my playmates and I tried to make our own crude bicycles. When the automobile engine was more recently developed we bought castings and tried to make our own engines for driving bicycles and some of us succeeded. We also made electric dynamos and motors. I made a small steam turbine but all of those crazes are events of the past. And now that the radio is introduced we find that a great many people get more pleasure out of making their own radio sets than they do in listening or in buying them.

Thus, it appears that immediately following a new mechanical development there is a craze for making it oneself which craze soon dies out upon finding that home-made products are seldom as good as those manufactured by specialists. Many a paper mill engineer has learned that it doesn't pay to try to make somebody else's specialty.

How Many Feet on a Reel?

INASMUCH as reels are so commonly used in paper mills for storing round rope, cables, wire, hose, etc., and inasmuch as I have never seen a satisfactory formula for computing the length of these stored or wound up, I set myself to the task of devising a formula or rule.

As a result, I believe I have developed a simple rule that may prove of value to engineers of paper mill power plants.



When a rope, cable, or wire winds upon a shaft or reel, it naturally assumes a position such as I have endeavored to indicate in the illustration. That is, the rope when winding onto the first layer seeks the "valleys" between the turns of the first layer. In this way the maximum length of rope is wound onto the reel. This is particularly true if the rope is taut.

To determine the number of feet on a reel, four measurements are necessary, three of which are in-

dicated on the sketch, the fourth being the diameter of the rope, wire, or cable, in inches.

The rule follows: "To the depth of the rope or cable 'd,' as indicated in the sketch, add 's,' the diameter of the shaft (all measurements in inches), multiply by the depth 'd' in inches, then multiply by the inside length of the reel in inches marked 'L' in the sketch, and then divide by the square of the diameter of the rope or cable in inches and, lastly, multiply by 0.3."

The answer will be the length in feet.

Furnace Linings Should Burn Out

ENGINEERS who have made a study of combustion and boiler efficiency state that if furnace linings do not burn out it usually is an indication of inefficiency.

In order that combustion may be most efficient, the temperature must be very high, although not too high of course. It has been found that by creating a high temperature in the furnace, boiler efficiency is increased and much fuel can thereby be saved.

Thus, in one instance an example was cited where furnace linings had been renewed only about once in six years or so. Changes were made in the operation of the furnace so that the temperature was increased. Then the side walls and arches burned out within a year, but 6,000 tons of coal were saved per year.

For the cost of 6,000 tons of coal, it is plain that many furnaces can be relined at a good profit.

Think it over and you will readily understand why high temperatures are more efficient. (1) By using too much air, it is obvious that a high temperature is impossible because the surplus air must be heated. Likewise, by using too little air, combustion is imperfect and the temperature cannot be high. Therefore, a high temperature is an indication of the right amount of air. (2) The higher the temperature the more rapid is the mixing of the gases and the more efficient the combustion of the fuel. (3) By having a high temperature there is a greater temperature difference between the water side and the heat side of the boiler tubes. It is well known that the greater the difference in temperature, the more effective and efficient is the heat transmission.

The Uniflow Engine

THE reason why the uniflow engine is coming into such prominence in the pulp and paper industry whereas Corliss and compound engines are "slipping" is that the uniflow is better adapted to variable loading. It can take care of a peak load one minute and a small load the next minute and operate with good economy all the time. The Corliss and compound engines are usually all right as long as the load is steady, but as soon as a load becomes variable it is best to leave it to a uniflow.

Distance Between Shaft Centers

EVERY once in a while, we want to know the distance between shaft centers. The length of belt and the radii of pulleys are known quantities, but the question is: "What is the distance between centers?" This question arises, for example, where an endless belt has been made and where machines are to be set at correct distances from the driven shaft, or where shafting is to be properly spaced to fit the belt.

To assist in solving such problems I have taken two of the best known and most used formulas and from them have developed the two rules below. Where there is considerable difference in the diameters of the pulleys apply the first rule, which I am calling "Rule No. 1."

Rule No. 1.—All measurements are in inches.

1.—Square the length of the belt.

2.—Multiply the square of the sum of the radii by 9.87.

3.—Add (1) and (2).

4.—Multiply the sum of the radii by the length of the belt and then by 6.28.

5.—Multiply the square of the difference of the radii by 4.

6.—Add (4) and (5).

7.—Subtract (6) from (3) and extract the square root of the difference.

8.—Divide by two.

This gives the difference between shaft centers in inches.

The following, "Rule No. 2," is much simpler than Rule No. 1 but it is less accurate for pulleys that are not equal in diameter. It is accurate for pulleys that are exactly equal in diameter but as the difference in diameter increases the rule becomes more and more inaccurate.

Rule No. 2.—All measurements are in inches.

1.—Add the radii and multiply by 3.14.

2.—Subtract this from the length of the belt.

3.—Divide by two.

This gives the distance between shaft centers in inches when the pulleys are equal or nearly equal in diameter.

Weak Gaskets

I FREQUENTLY learn of gaskets that blow out and do damage and that also cause considerable time loss owing to the necessity of laying up pipe lines for repairs.

The best remedy for blowouts, that I know of, is to install gaskets that do not blow out. In other words, use blowproof gaskets. There are gaskets on the market today that are exceedingly strong and I know one in particular that has never blown out and can see no reason why it ever should. It is constructed along the lines of Uncle Sam's gigantic cannon. In the con-

struction of big guns I understand they wind hot wire around and around on the outside of the barrel, the wire being built up to a considerable thickness, thereby adding much strength and actually placing the interior metal of the gun in compression, which is as it should be. The gasket to which I refer is built up in a similar manner. A piece of thin strip steel, bent into the form of a U, is wound around and around beginning with a size equal to the inside diameter of the pipe and it is built up until a diameter is obtained that is equal to the diameter of the inside bolt circle. As the winding proceeds, asbestos is wound between the steel layers thereby giving a combination steel and asbestos gasket which is leak proof, blowout proof, and flexible. It makes an ideal joint. The only argument that I know against the gasket is that it is thicker than most gaskets. But on the other hand, thickness is an advantage in that it enables it to be more flexible than other gaskets. A flexible joint is preferable to one that is not flexible because of the temperature difference at joints between bolts, pipe, and flanges. The flexible gasket compensates for these differences. Another advantage of this gasket is that other acid resisting and heat resisting metals, such as monel metal and everdur may be used in place of the steel.

The Tearing Test of Paper as Affected by Humidity

By E. SUTERMEISTER

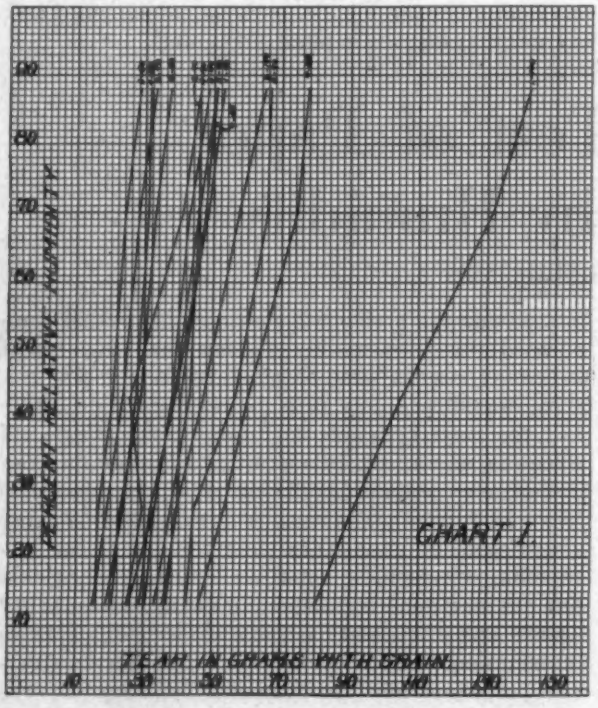
EVER since paper has been used by thoughtful persons, it has been evident that it is considerably affected by weather conditions; in "dog days" it is limp and flabby and has about as much "backbone" as an old rag, while in a heated room in winter, it is hard and rattly and is so brittle that it is difficult to fold without cracking. Such extremes usually do not occur during the same period of the year but variations during any season are likely to be great enough to cause very serious trouble, not only to the printer, but to the paper maker as well. When papers are purchased on specification, or even when they are supposed to come up to certain standards, it makes a vast difference whether those specifications and standards were established in winter or summer, unless the concern fixing the standards is fortunate enough to have a constant humidity room in which to carry out its tests. Cases have been known where a paper was developed during the summer months and gave good satisfaction during that period, yet in winter it was found almost impossible to make it test strong enough, in spite of great care in manufacturing. The truth of the matter was that the paper made in winter was actually as strong as that made in summer, but the dryer condition of the winter atmosphere made it test lower. When enough moisture was added to the atmosphere to bring it to summer conditions, the paper was found to be entirely satisfactory.

It is evident that paper tests which are to be of the most value should be made under constant humidity conditions, but unfortunately, comparatively few concerns, either producers or consumers of paper, have rooms in which the humidity can be controlled. Moreover, there has recently sprung up a rather vigorous controversy as to whether the correct humidity for a testing room is 65 per cent or 50 per cent, and in studying the problem one concern has rather complicated the situation by stating that their most indicative results were obtained at 35 per cent relative humidity. Since it is not yet possible to establish the most desirable conditions for testing, and since few plants are in a position to maintain even moderately constant conditions, it becomes desirable to see how greatly the various tests applied to paper are affected by changes in the humidity of the surrounding atmosphere. More or less work along this line has been done, but some of it is of a contradictory nature and it seemed desirable to accumulate more information. The following work was therefore carried out to see how the Elmendorf tearing test was affected by changes in the relative humidity.

Description of Test

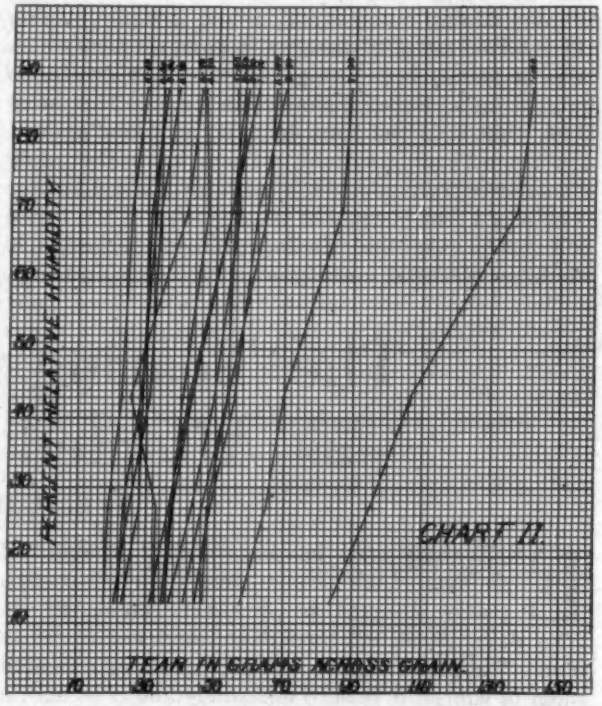
Seven different grades of book papers were selected for the trials and heavy and light weight sheets of each grade were tested. The furnish for these papers, with one exception, consisted of sulphite and soda fiber and no ground wood was used in any case. Two samples, numbers 1 and 2, were coated while the others were plain papers ranging from an antique to a super-calendered. The samples for testing were all cut at the same time and after preparing were stored in a book-case drawer until wanted. They were so taken that each sample was, as nearly as possible, like every other sample. Uniformity can be depended upon in all cases where the tear is with the grain and for four out of the seven samples when the tear is across the grain. Because of the nature of the samples supplied there is a slight chance that the test samples in the other three cases did not all contain parts of the same sheets, though it is certain that the papers were of the right grade and weight. Any variations which might originate from this cause are thought to be extremely slight.

Since a constant humidity room was not available, the tests had to be made when weather conditions were such that the desired humidity could be maintained over a period of several hours. For this reason, the temperature varied somewhat between tests, 66° F. being about the lowest and 87° F. the highest dry bulb reading. As the temperature is usually considered to be without much influence on the physical tests of paper, this variation is not thought to be serious. When conditions were thought to be

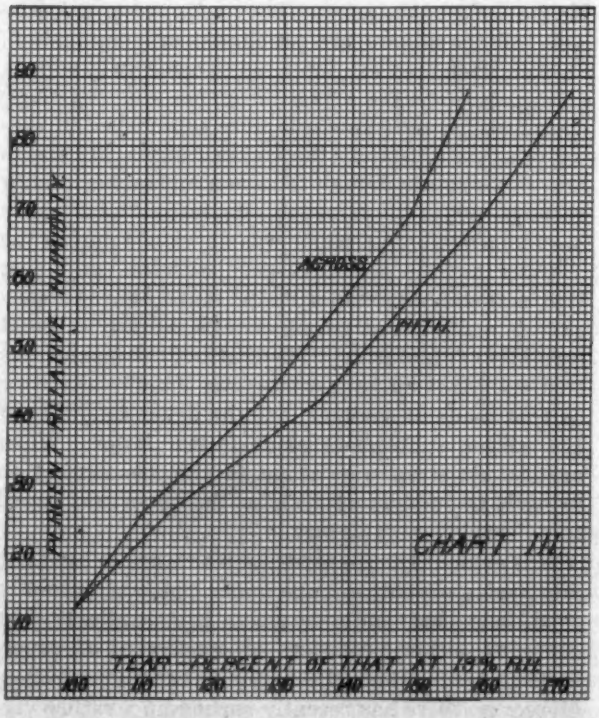


about right, the strips to be tested were suspended in front of a small electric fan and a good circulation of air maintained around them. Observations of the wet and dry bulb thermometers were taken at frequent intervals, and if reasonable uniformity and the desired humidity had been maintained for at least two hours the tests were carried out. If too great variations in humidity were observed the test was postponed until better conditions obtained. The actual testing required a little over an hour and during this period the observations of temperature and humidity were continued as in the preliminary period. At least one series of tests was discarded because conditions during the actual testing varied more than it was thought safe to allow.

All tearing tests were made on eight sheets and each result, as given in the tables, is the average of eight tears. In the case of grade 6, the heavy weight paper was not available when the tests at 43 per cent relative humidity were made and it was attempted to duplicate conditions later in order to fill out the records. The results are given in the table, but for some unknown reason they are out of line with the others and were omitted in calculating the general average for this humidity. The following table sum-



marizes the results of these tests, giving the average values but not the maximum and minimum figures for each grade. These figures are also shown



graphically in charts I and II for the individual samples, while chart III shows the percentage strength

at increasing humidities based on the tests at 13 per cent humidity as 100. This chart includes only the averages of the fourteen samples tested.

Elmdorf Tearing Test in Grams.

Tear with the grain.

Date of Test—Dec. 31. Jan. 3. Aug.1. Aug.5. Aug.12.						
Temperature, dry bulb		79-84	81-87	73-75	70-80	66-68
Relative humidity %		11-15	26-29	42-45	67-75	87-88
Paper grade	Wt. per Rm. 25x38					
1	100	80.0	90.4	104.6	131.6	142.0
1	70	30.2	32.6	38.8	48.6	53.0
2	100	36.2	39.0	47.2	57.6	65.2
2	70	14.8	18.8	23.6	28.2	33.0
3	70	42.2	44.2	56.2	65.8	66.4
3	50	25.8	32.8	38.0	43.0	48.2
4	70	33.2	37.6	43.0	45.6	46.2
4	50	18.8	23.8	27.2	30.6	31.2
5	70	28.6	31.8	38.8	45.8	50.6
5	50	15.8	16.2	20.4	24.2	28.4
6	70	25.0	29.2	25.8	40.8	46.0
6	50	20.2	22.6	28.8	33.2	37.8
7	68	46.0	53.2	60.0	74.2	77.2
7	45	35.2	39.2	40.2	47.6	50.6
Average		32.2	36.6	43.6	51.2	55.4

Tear across the grain.

1	100	83.2	94.8	106.2	137.8	141.6
1	70	35.8	37.8	43.0	54.2	61.6
2	100	40.8	46.0	53.4	64.6	67.0
2	70	21.0	25.0	30.4	33.8	39.0
3	70	44.2	48.4	55.6	62.0	69.4
3	50	31.6	36.4	42.8	54.4	57.8
4	70	34.8	36.6	40.6	47.6	46.2
4	50	23.4	28.0	28.6	31.2	35.6
5	70	46.2	47.4	53.4	55.6	59.0
5	50	18.0	19.0	22.8	25.2	29.2
6	70	32.8	33.0	25.2	41.8	45.2
6	50	22.0	23.6	28.4	32.4	34.2
7	68	57.6	64.8	69.8	86.2	88.8
7	45	36.8	43.0	49.8	56.6	55.6
Average		37.8	41.6	48.0	56.0	59.2

In considering these results it should be noted that there is nothing impossible or even abnormal about the atmospheric conditions during the tests. On August 1, 5, and 12, respectively, relative humidities of 43, 70, and 88 per cent were obtained merely by opening or closing windows, and entirely without artificial drying or moistening, or without the application of any heat. The test of December 31, at a relative humidity of 13 per cent, was made in a fair-sized room with windows closed and steam on two radiators. In other words, these conditions are exactly similar to those which would be expected in printing shops where ventilation depends on windows, and where no attempt is made to regulate humidity. Doubtless, records as varied as this could be obtained in the great majority of printing plants located in climates similar to that of New England.

The test of January 3 was made in the same room as that of December 31, but previous to the test a pet-cock on one of the radiators was open all night. The next morning a second pet-cock was opened and both allowed to blow steam into the room, while at the same time a little cold air was admitted from one of the windows. It was found impossible to increase the relative humidity by cooling the atmosphere as the two temperatures, wet and dry bulb, dropped proportionally. With both pet-cocks nearly wide open for three hours the highest humidity observed was 30 per cent. At the end of the test, the pet-cocks were closed, and without any other change in conditions the relative humidity dropped to 13 per cent in just 12 minutes. This is a most startling example of the difficulty in humidifying a room during winter weather.

A study of the tables and charts in this report shows that the tearing strength increases quite uniformly as the humidity rises and that the increase in strength is nearly the same in both directions. Apparently 100-lb. paper of grade 1 increases in strength more rapidly than the others, but this is merely because it is stronger to start with; if the increase is calculated on a percentage basis, it is found to be practically the same as the others. Chart III gives the best idea of the effect of humidity on the tearing strength of papers. It shows that if standards are established under winter conditions—around 13 per cent relative humidity—the same paper may be as much as 50 per cent stronger in the damp days of summer. Tearing tests, therefore, unless the conditions under which they were made are stated, are very likely to be misleading, and complaints based on such tests are very apt to be unjust to either the maker or the consumer of the paper.

Conferencitis

Many an organization suffers from conferencitis, such as when an executive calls together his immediate subordinates and, without profiting by their views, wastes many high priced man-hours in useless repetition of his instructions.

The cure for conferencitis in nearly every case is in the hands of the man higher up. He should call no conference of any kind that is unnecessary; he should go into every conference with a clear idea of its object; he should suppress all irrelevant gabble in himself and his associates; and he should at the earliest possible moment dispatch the work in hand and get himself and everyone else back on the job. —Gilder.

Editorial Comment

By WILLIAM SIBLEY

And What Will Poor Congress Do Then?

DURING the Sixty-Eighth Congress, more consideration was given to Muscle Shoals than to any other measure. It was legislated up one side and down the other, running the gauntlet of both House and Senate, gathering amendments here and leaving them there, until finally, after the fashion set by Pontius Pilate, Congress washed its hands of the whole affair by recommending to the President that a commission be appointed to study the question in all its phases that, in another session, wiser legislation might be enacted.

In the meantime, construction has been progressing at a reasonable rate. Muscle Shoals should generate electricity in July or August. But where it is going to be used? Congress, to whom delay means nothing, has made no provision for the disposition of the power—and it will not assemble again until December.

No doubt the much maligned power companies in the Shoals district will assume the responsibility of distributing the power generated throughout the Southeast. By so doing they will be "turning the other cheek," for during the past two years they have been in for a great deal of unjust abuse. What our deliberate Congress will do after a three or four month's demonstration, time alone can tell. We have hopes (but not much faith) that early in the coming session the Muscle Shoals matter will be wisely, and definitely, closed.

The whole matter is something that should make those engaged in the power industry thankful they are somewhat free from governmental interference. The transportation field has been full of "Muscle Shoals" for a good many years. Legislative control and congressional inaction have meant delays, harassings and sleepless nights for railroad men. The power field, through the Muscle Shoals incident, may well congratulate itself on its freedom from bureaucratic dabblings.

It Is the Little Things That Count

THERE is an old fable to the effect that a tiny ant once saved the life of a huge elephant. That fable, for the industrialist, means—"pay attention to the little things."

Not long ago a large Chicago printing establishment was compelled to stop its presses and close its doors for nearly six months, all because of an $18-a-week girl. The printing house had nearly completed an exceptionally large contract for mail order catalogues. Paper had been purchased in 20 car-load lots and the composition and engraving costs had been enormous. The work had been printed in "forms," gathered, bound, and trimmed. In the last operation, however, the girl operating a trimmer set the knife a quarter-inch to far forward—and trimmed the prices off every article in the catalogue, instead of merely trimming the edges. Firing the girl failed to keep the printing house out of bankruptcy.

One official in a medium sized plant found, after a little research, that the operation of winding time clocks, recorders, etc., cost him $210 a year. Few would ever think of clock winding as an expensive operation.

A machine costing $25,000 to build and install in one of our public utilities, failed to function properly when started. The cause of the trouble was traced to an inaccurate micrometer, costing $5.50.

In Milwaukee, a sausage making plant recently suffered a serious loss in production. After a great deal of time consuming and expensive investigation, the cause of the decrease was found to be a $28 belt.

The production of a machine shop located in Cincinnati increased 22 per cent when the original 100 watt lamps were replaced with lamps of 200 watt. In Toledo, the spoilage of one factory decreased over 50 per cent after the windows and lamp shades had been washed—an operation costing about $30.

Big wastes are more or less obvious and easy of correction. It is in the little operation, the details, that lurk the real danger to the welfare of the dividends. Watch the details. Know what you are buying and what you are selling. Know from whom you buy and to whom you sell. In terms of production and distribution, knowledge is profits.

Safety Inspections—Where and When

CARL B. AUEL, president of the National Safety Council, has set forth his ten commandments for safety. They are well worth serious thought by every industrial executive and worker, since "any plant can be made as safe as the management and the workers want it to be." The commandments are as follows:

Health and contentment
Minimum labor turnover
Cleanliness and neatness
Good lighting
Prohibition
Education
Intelligence, skill and care
Mechanical and equivalent guards
English language
A measured pace.

(The latter includes elimination of driving methods; absence of rush at quitting hours, recesses, or clean-up periods, and a suitably studied wage system.)

Mr. Auel has also set forth a brief list of mechani-

—— on Timely Subjects

cal equipment that requires periodic inspections. He sets forth the maximum periods of time for safety inspection.

Interval Between Inspections

Stair treads and railings	3 months
Warning signs	12 months
Elevators	Constantly
Cranes, crane chains and hooks	Constantly
Emery wheels, guards and water supply	6 months
Hand tools, mushroom heads, broken handles	6 months
Crane operators (physical examination)	12 months
Food handlers (cafeteria employees)	6 months
First-aid cabinets	Weekly
Stretcher cabinets	12 months
Ladders	6 months
Hand trucks	6 months
Safety meetings	1 to 3 months

The Cost of Automobiles

DURING 1925, the sale of automotive products will total $5,325,000,000. Forty-three per cent of this huge sum will be expended for new equipment, the retail sales of passenger cars being estimated at $1,900,000,000, and new commercial cars at $375,000,000. The remainder will be spent for maintenance and operation, the subdivisions being as follows: gasoline and oil, $1,490,000,000; replacement parts and service, $685,000,000; tires, $600,000,000 and accessories, 275,000,000. Taking $50 as the average annual sum per motor vehicle paid out to labor, the 17 million odd vehicles now in use will cost us $850,000,000 in labor charges. Adding this figure to the estimated total of retail sales, we find automobiles costing the staggering sum of more than six billions of dollars. At least, such are the predictions of J. H. Collins, of the Chilton Company, Philadelphia.

There were 47,104 automobile dealers in the United States in 1924. Of these 11,540 were Ford dealers. The gross business in new motor vehicles in 1924 totaled $2,275,000,000, of which $855,000,000 was done by Ford dealers. In spite of the fact that Ford dealers last year averaged $74,090 and "other" dealers averaged nearly $40,000, twenty-one out of every one hundred dealers went out of business. This mortality was low, however, in the light of previous years. In 1923 the "turn-over" in automobile dealers was 25 per cent, and in 1922, 26 per cent.

Since 1912 we have thrown away 6,011,000 motor vehicles. This figure includes the 1,490,000, scrapped during 1924—the first year in history that we have scrapped more than a million cars. It is estimated that during 1925 nearly 1,450,000 cars will be scrapped.

Prediction has it that the 1925 production of tires should reach 55,000,000, or a total nearly ten per cent greater than that of 1924.

Commercial Aviation Rapidly Becoming a Reality

TRANSPORTATION, since the beginning of time, has been a problem of major proportions. The ability to move objects, people or thought has, in large measure, determined the progress of all peoples. Transportation is basic in all things industrial and social.

Time was when we mapped our industrial enterprises and shaped our commercial plans to fit wagon haulage, canal boats and warehouses as transportation. Passenger traffic was confined to stage-coach travel, operating over private and public turnpikes. The steam railroad destroyed this system. The past sixty years has brought far-reaching developments in the steam railroad, with even greater developments in industry and agriculture. Today, the motor vehicle, especially the bus and the truck, is proving a keen competitor to the steam propelled utility. Many railroads have adopted the motor truck for certain short-haul freight traffic, while others operate bus lines for passenger traffic.

The motor vehicle is approaching its final development. Few revolutionary changes remain. The elimination of noise, the adoption of the pull, instead of the push principle (four-wheel drive, perhaps) and the development of a more substantial tire, are the last major improvements to be made.

And so we find ourselves turning to aviation, which is an established fact now in several European countries and which is on a fairly sound basis in the United States. Much remains to be done in the establishment of aviation as a basic industry, however. Improved machines, more and larger landing fields, aerial lighthouses, vital legislation are yet to come. But we now have an excellent start, and it is a beginning everyone should encourage and aid so far as possible.

With the active assistance of the Ford interests, 1925 should see commercial aviation firmly on its feet and 1926 its quite extensive use. Like motor vehicles, aerial transportation will remain a supplementary rather than a competitive device to our rail transportation, for many years to come. However, our changes and developments are being made ever more quickly and we believe we can look forward to airplane service as becoming an absolute necessity in just a few years. It took hundreds of years to make the change from the two-wheeled cart to the four-wheeled wagon. About one hundred years were required to make the change from wagons to the steam railroad. Only about thirty years were required for the development of the automobile. There is every reason to believe the development of aerial transportation will show corresponding speed of development.

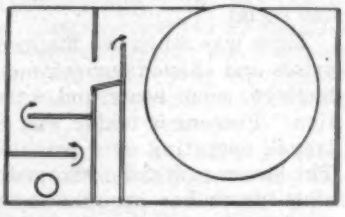
Practical Helps for the Mill Man

High Pressure Speed on Wire Showers

AS A result of the attention being given to white water losses, many mills have been able to reduce these losses a large extent by cutting down the volume of fresh water used at various points and decreasing the white water overflowing to the sewer accordingly. One mill has found it possible to reduce the volume of fresh water used on the wire showers by increasing the pressure and using much smaller holes in the shower pipe, depending on the pressure rather than the large volume of water to keep wire clean.

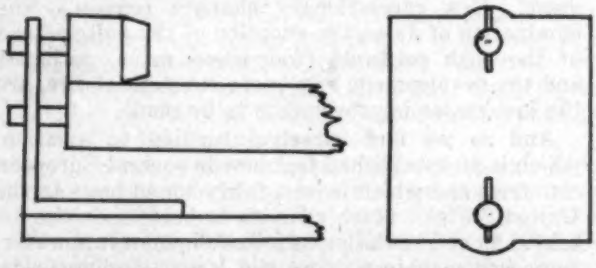
Cylinder Vat for Board Machine

ON WIDE cylinder machines making boxboard, it is sometimes difficult to distribute the stock entering uniformly across the vat to form an even sheet. The cross-section sketch shows an arrangement of baffles in the vat that gives a very uniform distribution of the stock and prevents swirling and cross-currents. Two baffles are placed horizontally, as shown, which break the flow of the stock, which enters the bottom at one side. Before coming in contact with the cylinder mold, it passes over another baffle placed vertically. Openings covered with hand plates are placed in the front side, making all corners accessible when washing out.



Hand Plate for Cylinder Machine Vat

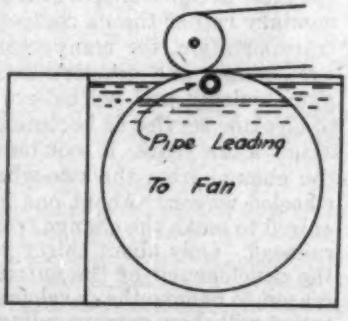
THE hand plate shown in the sketch is a small item on a cylinder machine, but one which has saved some trouble in cleaning out the vat. Three or four of these are placed at



different points on the front side where it is desirable to use the hose at points inaccessible from the top. The plate is held in place by wedged keys fastened to the vat with chains so they will not be lost and are easily and quickly removed or replaced again.

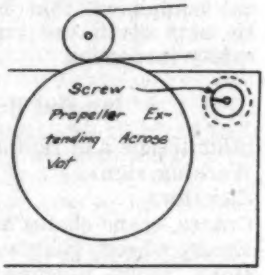
Exhaust Fan on Cylinder Machine

ON CYLINDER machine running on slow stock for rope paper and others running at high speed, difficulty is sometimes experienced; is sometimes found in forming the sheet properly and holding it to the surface of the cylinder would be picked up by the couch. To remedy this, an exhaust fan connected to the space in above the white water in the top of the cylinder mold has been found to be beneficial. The openings at the upper part of the ends of the cylinders are covered and the 4-inch pipe from the fan enters through one of them, although only a small suction is created because of the open section of the cylinder mold between the couch and the level of the stock, enough is obtained to help formation materially.



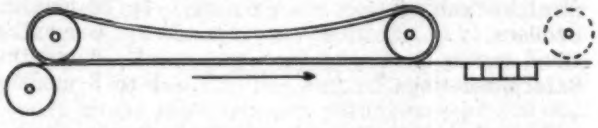
An Aid to Formation for Cylinder Machine

TO IMPROVE the formation on a cylinder machine and partly overcome the tendency of the fibres to lay all in one direction of the revolving cylinder, the attachment shown in the sketch has been used with good results on heavy papers. The screw propeller is placed just under the surface of the stock where the wire enters. This produces a cross current forming the mat of fibres laying in different directions.



Deckles Shortened

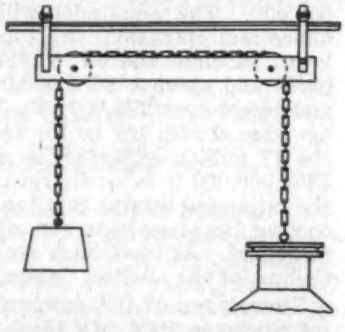
BY SHORTENING the deckles on a machine in the manner indicated, a large saving was made in the original price and life of the deckles used as well as increasing the life of



the wire by a week. The change was made on a machine making book paper. Instead of carrying the deckle past the suction boxes almost to the couch roll, the deckle pulley was moved back to a point just in back of the suction boxes where the sheet was formed sufficiently to hold itself in place.

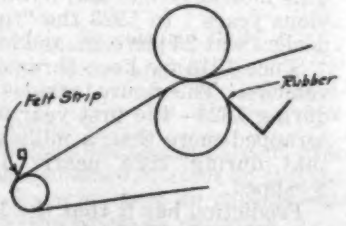
Hoist for Digester Cover

TO REPLACE the hand cramp or chain block usually used to remove the cover from a pulp digester, the counter-balanced hoist shown in the sketch has been used. The counter weight is the same weight as the cover, so that after the bolts are taken out the cover is easily and quickly lifted by one man. The weight is supported by a chain running over two pulleys carried on an overhead trolley. By attaching a device to hold the weight in position after the chain is removed from the cover, it may be moved from one digester to another, as desired.



Two Helps for Binder Board Wet Machine

TWO simple attachments that have helped materially on a binder board wet machine are shown in the sketch. A felt strip fastened to a pole so that it drags over the wet machine felt in the manner indicated has been of great benefit in keeping the felt clean, which is important,—since there is much dirt in the water coming from the stock.



The other addition is a V-shaped trough with an edge covered with a strip of rubber belting touching the lower press roll. This takes the water from the roll which con-

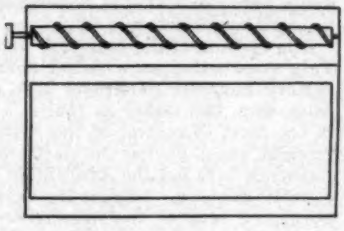
tains much dirt and prevents it from being carried around the roll and being picked up by the felt again.

Splicing Tape for Breaks

THE use of gutta percha splicing tape for splicing breaks on the paper machine is being used advantageously in many mills and should find still more general application. Where glue is used in splicing light weight paper, this is apt to soak through two or three layers, causing some trouble and waste. The tape is applied by placing it between the two layers of paper to be spliced together and running a hot iron over them. It is supplied in various weights and widths suitable for different grades of paper and is sold by the pound.

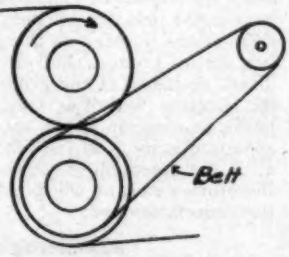
Worm Roll Removing Foam

TROUBLE occurring from foam collecting in the vat of a cylinder machine and being picked up on the couch roll has been effectively remedied by putting on a worm roll in the manner shown. The foam is carried by the roll to the back side of the machine and forced over the edge into a trough. The roll is turned by a pulley on an extension of the shaft through the side of the vat and driven from a nearby countershaft.



Belt Guard for Smoothing Press

IN TAKING the sheet of paper through the smoothing press in the reversed direction, it is very easy for the operator to get his fingers caught between the presses. This danger has been greatly lessened by attaching a short 1½-inch belt in the manner shown. In taking the paper through the press it is merely laid on the belt and carried through between the rolls. The belt runs on the end of the bottom roll and a small pulley supported by an arm attached to the machine frame. This serves both as a carrier and a guard, for as soon as a man touches the belt with his hand he is warned that it is near the presses.



Air Used to Blow Water from Doctor

IN ONE mill trouble was quite frequently encountered when a small amount of water was carried up on the press roll, at times enough accumulating to be carried under the doctor and down on the sheet, making spots in the paper. By attaching a small nozzle to the air line in a position to blow this to one side and off from the doctor, this trouble was effectively eliminated.

To prevent licking up of the paper by the dandy roll, sprinkling it with turpentine has given good results.

Belt Carrier for Board Machine

ON A large boxboard machine having a number of decks of dryers and extending up through the floor above, taking the sheet over the machine presented a rather difficult problem. A carrier made of two two-inch belts running together, one over the other, has made this much easier. The sheet coming from the last press is taken between the two belts and carried over the dryers in the usual manner.

You have no right to take a chance; the other fellow may have to take the consequences.—"Making Paper."

Mr. Bearce Is Visiting Mills

On May 11, George D. Bearce, engineer of the News Print Service Bureau, left New York for a tour of the mills in the West, which will occupy nearly two months of his time. His first stop will be Erie, Pa., where he will consult with the engineers and cost accountants of the Hammermill Paper Co. He will then proceed to Kalamazoo, Mich., visiting Fred C. Clark at the Hawthorne Paper Co.'s plant to get additional data on white water recover.

Among other plants to be visited by Mr. Bearce in his swing around the country are the Nekoosa-Edwards Paper Co. at Port Edwards, Wis.; Marathon Paper Co., Wausau, Wis.; Wausau Sulphate Fibre Co., Mosinee; Wausau Paper Mills Co., Brokaw; Grandfather Falls Co., Merrill; Kimberly-Clark Co., and Wisconsin River Paper and Pulp Co., Neenah, Wis.

Mr. Bearce expects to reach Milwaukee on Monday, May 18, for the annual Power Show in that city, which lasts a week. A conference of the cost accountants and engineers of the News Print Service Bureau has been arranged for Wednesday, May 20, at which papers will be read and discussed and a visit of inspection paid to the Lakeside plant of the Milwaukee Light and Power Co. Flow meters are to be the chief topic of papers and discussion at the conference in the Power Show on Wednesday. The chief speakers will be H. D. Savage, vice-president of the Milwaukee Light and Power Co.; H. D. Fisher, chief engineer of the New Haven Pulp and Board Co., New Haven, Conn., and Mr. Greenberg, of the Bailey Meter Co.

Leaving Milwaukee, Mr. Bearce's itinerary takes him to Peshtigo and Marinette, Wis., and thence to Escanaba, Munising and Manistique, Mich. He then goes to Canada, visiting mills at the Soo, Port Arthur and Fort William.

On June 6 he will reach Duluth and spend Sunday there. He will next visit the plant of the Northwest Paper Co. at Cloquet, Minn. On the return trip he will stop at Park Falls and Ladysmith, Wis., and after calling on the Watab Paper Co. at Sartell, Minn., he will go to Madison for a visit to the engineers connected with the Forest Products Laboratory who are now working on white water losses and other waste problems. He will then take train for Chicago and New York, returning to the Bureau on Monday, June 22.

Training in the Paper Industry

At the annual meeting of TAPPI it was decided to form a committee on training in the industry to supplement the work which had been done by a committee on vocational education. This had been to co-operate with the joint committee in the preparation of the textbooks on the *Manufacture of Pulp and Paper*, to raise its quota of funds needed to finance the publication, to assist in the establishment of correspondence courses in pulp and paper, and to stimulate the use of the textbooks in the paper mills particularly of United States.

After six years' work it was felt that since the textbooks were completed and facilities for vocational education had been provided, its work was finished.

As the membership of the Technical Association is largely recruited from the young technically trained men who enter the industry after graduation, it was decided that the first duty both to them and to the industry, was to see that these young men were enabled to become trained in pulp and paper manufacture and thereby fitted for executive positions.

In order to develop a plan whereby such training might be provided by the paper mills which recognize the need, the committee on training in the industry was appointed. For chairman, the executive committee selected Martin L. Griffin, one of the deans of the technical men in the paper industry, and as he has always been vitally interested in this subject, he willingly accepted. On the committee will be James A. Moyer, director of the University Extension of Massachusetts, who has consented to act. A number of paper mill executives, who have been closely identified with the association, are being selected, and with them members of several technical schools, many of whose graduates regularly enter the paper field.

J. A. Morrison, for many years master mechanic at the Fort Edward mill of the International Paper Co., is now master mechanic at the plant of the United Paper Co., at Thomson, N. Y.

The American Paper and Pulp Association

Its Work for the Perpetuation of the American Paper Industry

By NORMAN W. WILSON
Hammermill Paper Company

THERE is always a reason for any organization among men which continues for any period of time. The American Paper and Pulp Association has recently held its 48th annual meeting, and it appears to be stronger today than ever before, both financially and in its ability to give service to the paper industry. It would be quite in place to ask for the reasons for such an organization as the American Paper and Pulp Association.

When manufacturing of commodities began in this country, the manufacturing establishment was often the home or an outbuilding close to the home. The output of this type of establishment was disposed of largely locally and often barter or exchange of commodities entered into the disposal of the product. Gradually, as population grew, commodities were sold outside of the community or the section where they were produced and competition and other phases of economic necessity resulted in the development of machinery; then came the building of manufacturing plants and as the size of the plant grew and the need for the commodity extended often to widely separated communities, there came problems of transportation as well as of merchandising and finally problems of credit. Two hundred years of paper manufacturing in America has established the industry as an essential part of the great group of American industries, with all of the complex problems facing an industry producing commodities for the world market.

When manufacturing was a community affair and when there was one paper mill in this community or state, and another in a widely separated community or state, each manufacturer was forced to meet and solve his own problems. Very commonly he felt that his competitor was an enemy and that under no circumstances could he work with him in a helpful way. In the paper industry it took many years for the manufacturers to become acquainted, and the first gathering of manufacturers in meetings or in banquets were largely gatherings for social purposes. As the men became better acquainted and talked more freely of their problems, they came to see that many of their problems were common and that the competitor, instead of an enemy, might be a mighty fine fellow and a good friend. Every increasing pressure of competition finally brought manufacturers together in groups and finally into organizations with the thought of very definite help coming from a discussion of mutual problems and of assistance in the solving of common problems through organized and unified effort.

During the past twenty-five years, the common problems confronting the paper industry have gradually become very definite in character, so that today if the question as to what are the most important problems confronting the paper industry was put to a group of one hundred paper manufacturers in different parts of the country, the answers would be practically identical, though the sequence parts of the answers might be different. Gradually, therefore, out of the mist of unfriendliness and distrust caused by lack of acquaintanceship or a feeling of self-sufficiency there has come a very clear definition, not only as to what are common problems but as to organizations which can assist the industry in the solving of these problems.

Through its forty-eight years of existence, the American Paper and Pulp Association has changed much in its form of organization and in its character of service to the industry. As all organized groups of men, whether religious, fraternal or business, change in character from year to year, or period to period, so the American Paper and Pulp Association has had its changes and its ups and downs. Because it failed to fully meet certain requirements in the industry, separate groups of the industry came together and formed their own associations, and these group associations have progressed much as has the central organization, until today the industry is well organized with the central or federated organization and a group of affiliated associations, giving excellent service to paper manufacturers as groups and as a whole.

The opening of the year 1925 finds the American Paper and Pulp Association on a sound financial basis. Past unsatisfactory financial conditions have not been due to faults in leadership, but rather to faults in methods of financing and in the form of control of the central organization. Changes brought about during the past two years in the methods of financing have put the Association into position to go forward soundly financed. During the same period the change in the governing body of the Association from a large and rather loosely organized group to a small and more closely organized committee has meant soundness in the control of the activities of the Association and therefore in its service to the industry.

In stating briefly some of the problems which are confronting the industry, the question as to the reason for the Association will be answered. It is understood in the present organization of the paper industry that the American Paper and Pulp Association shall deal with the larger general problems in the industry common to all groups, while the affiliated associations, insofar as there are affiliated associations serving special groups, shall deal with the particular and more direct problems of the groups which they serve. Therefore, the common activities which are outlined below represent problems common to the entire industry and well within the sphere of activity of the central organization. It would seem as if the outstanding common problems of the industry and therefore problems which present opportunity for service by the Association are:

Representing the Paper Industry

The paper industry as a whole voices its needs and activities through American Paper and Pulp, thereby enabling the industry to speak as a unit at Washington and in the several state capitals. As an organization representing the entire industry, its activities make for increasing harmony of action with other great industries and the public.

Permanent Supply of Raw Materials

As permanency or continuity of employment is essential to the happiness and welfare of the average individual, so permanency of supply of raw material for an industry is essential to the satisfactory forward movement of that industry. Unfortunately, the paper industry is dependent upon a raw material that is being steadily depleted, with the result that the industry is depending upon a raw material that is bound to increase steadily in cost. The Association, through its efforts toward perpetuating the forests of the country and in determining the value of new raw materials is giving service of decided value to the industry.

Statistics

The Association in furnishing its members with weekly and monthly reports on production, shipments and stocks of various grades of pulp and paper, is giving the industry the only clear picture of the fluctuations of the industry as a whole. With the assistance of affiliated associations, the statistics of the Association are becoming increasingly accurate and complete and therefore of increasing value to individual manufacturers.

Information

The industries of the country today must have agencies which can serve as clearing houses for information needed by the Federal Government and the states and by the public. Information which the Association is giving constantly is accurate, and while at times it is informative and educational in value only, at other times it is of great advertising value. There is very definite need for aggressive work by the Association along this particlar line.

Tariff and Tax Service

The Association effectively correlates the tariff needs of the industry in the framing of new tariff laws. At all times it works aggressively in the interests of the whole industry in the representation of the industry before the Tariff Commission in cases under the flexible provision of the tariff laws, and in other cases.

As with tariff matters, so the Association is assisting along lines of general and special tax matters. In these particular matters the Association is being helped at all times by the Cost Association of the Paper Industry.

Emergency Service

The industry turns naturally to the Association in emergencies requiring the united action of all grades of the industry. An example of this emergency service is the assistance which the Association has given the industry in bringing about the formation of the Committee on the Perpetuation of the Paper Industry of the United States, the Import Committee of the Paper Industry and special committees on Casein and China Clay and on National Forestry Policy, etc. The fact that there is an organization to which the industry as a whole can turn at any time and in any emergency for assistance, more than justifies the industry's investment in the machinery for effective service now developed by the Association.

Research

The complex factors affecting the industry and the ever-increasing competition which the industry is facing is causing individual manufacturers and the industry as a whole to turn to the thought of securing help through investigation and research. The Association is active in many lines, particularly with the help of affiliated associations in research activity dealing with mill problems, raw materials, paper merchandising and similar problems, all of which are of direct and increasing value to the inlustry.

Distribution and New Markets

The attention which Secretary Hoover has focused upon the importance of the problem of distribution in this country emphasizes the service which the Association can give directly and through its affiliated organizations in investigating the possibilities of the new uses of paper and new markets. Its contacts with Washington and representatives of the Government abroad are frequently of extreme value to individual paper concerns.

The question as to what trade association may or may not do has at times seemed to disturb the minds of individual manufacturers. Anti-trust laws have been on the statute books of the country for many years and the successful operation of trade associations for the past ten years has been an experience which has indicated clearly just what a trade association may do legally and what it may not do. Fortunately, the work of the Association is very ably guided, from a legal standpoint, by Mr. Henry A. Wise, of Wise, Whitney & Parker, of New York City. The staff of the Association is watching constantly every phase of organized effort in the industry to see that at no time and in no place is the Association overstepping the legal bounds of organized trade association work in this country.

The legislatures of the country from Congress down seem determined to put an increasing number of laws upon the statute books of the states and the Federal Government. This fact alone is one of the strongest arguments for a thoroughly effective unified front on the part of the industry. The American Paper and Pulp Association offers the opportunity for such a unified front in protecting, promoting and perpetuating the paper industry in the United States.

The Chemical Constitution of Flax Straw and the Weakening of the Bast by Various Pulping Methods*

By SIDNEY D. WELLS[1] and EARL R. SCHAFER[2]

These studies indicate that the components of the stem of the flax plant known to the textile and allied trades as bast and shive are widely different in their chemical characteristics.

The bast seems to consist of relatively pure celluloid absorbed to which are carbohydrates soluble in hot water or mild alkaline treatment while the shive is composed of cellulose in close combination with pentosans and lignin. A large number of various treatments failed to indicate any that were capable of softening or disintegrating the shive without marked reduction in the tensible strength of the bast.

IN THE efforts of the Forest Products Laboratory during the past three years to develop economic methods for utilizing in the pulp and paper industry the flax straw obtained as a by-product from the cultivation of flax seed, it was soon realized that any known chemical methods for disintegrating the woody matter of the stem in order to islate the bast seriously reduced the strength or the toughness of the latter. Chemical studies of the bast, shive, and the two combined as they exist in the whole straw, and studies of the influence of various treatments on the strength of the bast were carried out as an auxiliary phase of the work. The results shed considerable light on the problem and seem to warrant review at this time.

The chemical investigation followed two general lines of procedure: First, the empirical chemical tests commonly used in studying the nature and constitution of fibrous plant materials, supplemented by, second, strength tests of unbleached linen cloth which had been included in cooks of flax tow and subjected to the same pulping treatment.

TABLE 2—Analytical Study of Results Expressed in Table 1.

	Bast	Shive
	Per cent	Per cent
Soluble in alcohol-benzol	2.3	6.5
Soluble in hot water after extraction with alcohol-benzol	11.1	5.1
Soluble in 1 per cent NaOH after extraction with alcohol-benzol	29.2	24.2
Soluble in 1 per cent NaOH corrected for hot water soluble	18.1	19.1
Cellulose, pentosan-free, removed by 1 per cent NaOH	4.4	11.2
Pentosans removed by 1 per cent NaOH	3.2	7.3
Soluble in 1 per cent NaOH, corrected for hot water soluble not accounted for by loss in cellulose and pentosan	10.5	0.6
Cellulose, after extraction with 1 per cent NaOH and alcohol-benzol	67.2	47.1
Pentosan in above cellulose	2.1	12.8
Cellulose, pentosan-free	65.1	34.3
Lignin, after extraction with alcohol-benzol and 1 per cent NaOH	2.9	24.1

The chemical tests were applied to the whole straw, the bast, and the shive or woody matter separated as completely as possible by hand. The latter, however, was adulterated to a certain extent with short fragments of bast which it was practically impossible to remove completely. The straw and shive were ground to pass a 60-mesh sieve, and the bast was cut into short lengths with scissors. The chemical tests are listed below, together with descriptions of or references to detailed methods of procedure:

1. Alcohol-benzene solubility. Test consisted of extraction for six hours in a Soxhlet extractor with a solution consisting of 67 per cent alcohol and 33 per cent benzene.

2. Solubility in 1 per cent NaOH. Boiling 2 grams of

*Presented at the 68th meeting of the American Chemical Society, Ithaca, N. Y., September 8-13, 1924.

[1] Engineer in Forest Products, U. S. Forest Products Laboratory, Madison, Wisconsin.

[2] Assistant Engineer in Forest Products, U. S. Forest Products Laboratory, Madison, Wisconsin.

TABLE 3—Effect of sodium hydroxide on the strength of linen cloth.

Cook No.	Old or new cloth	Cooked with straw or tow	NaOH		Max. temp. °C.	Time		Per cent yield of residue	Per cent bleach powder	Color† of Pulp	Per cent loss in strength of linen cloth	REMARKS
			Per cent	Grams per liter		Hrs. to max. temp.	Hrs. at max. temp.			Per cent white		
A-174-10	New	Med. tow	14.0	28.0	166	2¾	2¾	57.0	25	28	13.8	Pulp raw; Shives did not bleach.
A-166-14	Old	Med. tow	80.0	120.0	30	....	72	....	35	....	23.0	Pulp raw; Shives did not bleach
A-166- 5	Old	Med. tow	13.3	20.0	140	2	6	....	20	....	23.8	Pulp raw; Shives did not bleach.
A-166- 7	Old	Med. tow	13.3	20.0	155	2	6	....	20	....	24.5	Pulp raw; Shives did not bleach.
A-173-10	New	Straw	17.6	42.3	160	2	8	52.1	25	25	25.0	Pulp raw; Shives did not bleach.
A-166- 6	Old	Med. tow	13.3	20.0	140	2	10	....	20	....	30.2	Pulp raw; Shives did not bleach.
A-166- 8	Old	Med. tow	13.3	20.0	155	2	10	....	20	....	33.7	Pulp raw; Shives did not bleach.
A-166 Sup.	New	....	15.0	10.0	100	....	1	78.0	....	....	35.0	Linen cloth treated according to analytical method with 1% NaOH.
A-166 Sup.	Old	....	15.0	10.0	100	....	1	78.0	....	....	37.5	Linen cloth treated according to analytical method with 1% NaOH.
A-166-10	Old	Med. tow	13.3	20.0	170	2	6	....	20	....	39.6	Pulp raw; Shives did not bleach.
A-166- 9	Old	Med. tow	13.0	20.0	170	2	2	....	20	....	45.4	Pulp raw; Shives did not bleach
A-166-11	Old	Med. tow	20.0	30.0	155	2	6	....	30	....	54.3	Bleached to light yellow.
A-173- 4	New	Straw	22.0	52.8	160	2	8	41.6	16.5	47	62.5	Overcooked—Easy bleaching.

† Color after bleach treatment. Hess Ives Violet = per cent white.

TABLE 4—Effect of various combinations of sodium hydroxide and sodium phosphate on the strength of new linen cloth cooked with straw for two hours to a maximum temperature of 160°C. and for eight hours at 160°C.

Cook No.	Chemical				Per cent yield of pulp	Per cent bleach powder	Color† of pulp per cent white	Per cent loss in strength of linen cloth	REMARKS
	NaOH		Na_3PO_4						
	Per cent	Grams per liter	Per cent	Grams per liter					
A-173- 6	....	....	40.0	96.0	64.0	22.5	19	7.5	Pulp very raw. Shives black. Did not bleach.
A-173- 7	4.0	9.6	40.0	96.0	50.5	25	27	18.8	Pulp very raw. Shives black. Did not bleach.
A-173- 8	8.0	19.2	40.0	96.0	61.5	25	25	21.3	Pulp very raw. Shives black. Did not bleach.
A-173-12	13.0	42.3	40.0	96.0	46.7	25	32	36.2	Pulp very raw. Shives brown but did not bleach
A-173-11	17.6	42.3	40.0	96.0	41.8	25	38	51.3	Pulp raw. Shives hard to bleach.
A-173- 9	10.3	46.3	6.8	16.3	38.5	20	60	38.8	Pulp fairly well cooked.
A-173- 1	22.0	52.8	1.3	3.1	39.1	15	46	46.3	Pulp over-cooked.
A-173- 5	22.0	52.8	3.0	7.2	32.4	12.5	6.5	56.3	Pulp over-cooked.

† Color after bleach treatment. Hess Ives Violet = per cent white.

TABLE 5—Effect of various combinations of sodium hydroxide and sodium sulfite on the strength of new linen cloth cooked with medium tow for 2¾ hours to a maximum temperature of 166°C. and for 2¾ hours at 166°C.

Cook No.	Chemical				Per cent yield of pulp	Per cent bleach powder	Color† of pulp per cent white	Per cent loss in strength of linen cloth	REMARKS
	NaOH		Na_2SO_3						
	Per cent	Grams per liter	Per cent	Grams per liter					
A-174- 6	11.0	22.0	9.0	18.0	55.0	25	31	8.8	Pulp raw. Shives did not bleach.
A-174- 5	9.0	18.0	15.0	30.0	57.5	25	40	8.8	Pulp raw. Shives did not bleach.
A-174- 7	6.0	12.0	24.0	48.0	57.7	25	41	8.8	Pulp raw. Shives did not bleach.
A-174- 8	3.0	6.0	33.0	66.0	60.0	25	55	8.8	Pulp raw. Shives did not bleach.
A-174- 9	....	....	42.0	84.0	58.1	23	54	15.0	Pulp light colored but raw and slimy.
A-174- 4	6.7	13.4	21.5	45.0	61.0	25	46	12.5	Pulp raw. Shives did not bleach.
A-174-11	9.0	18.0	21.5	43.0	53.1	25	37	12.5	Pulp raw. Shives did not bleach.
A-174-12	11.0	22.0	21.5	43.0	53.3	25	36	12.5	Pulp raw. Shives did not bleach.
A-174-13	14.0	28.0	21.5	43.0	47.8	25	42	25.0	Pulp raw. Shives did not bleach.
A-174-14	17.0	34.0	21.5	43.0	44.6	25	60	32.5	Pulp bleached to light yellow.
A-174-15	....	....	21.5	43.0	58.6	25	57	8.8	Pulp light colored but raw and slimy.

† Color after bleach treatment. Hess Ives Violet = per cent white.

TABLE 6—Effect of various combinations of sodium hydroxide, sodium sulfite and sodium sulfide on the strength of linen cloth.

Cook No.	Old or new cloth	Cooked with straw or tow	Chemical						Max. temp. °C.	Time		Per cent yield of pulp	Per cent bleach powder	Color† of pulp per cent white	Per cent loss in strength of linen cloth	REMARKS
			NaOH		Na_2SO_3		Na_2S			Hrs. to max. temp.	Hrs. at max. temp.					
			Per cent	Grams per liter	Per cent	Gram per liter	Per cent	Grams per liter								
A-174- 3	New	Medium tow	5.0	10.0	21.5	43.0	3.3	6.6	166	2¾	2¾	61.3	25	35	3.6	Pulp raw. Shives did not bleach.
A-174- 2	New	Medium tow	2.7	5.4	21.5	43.0	8.0	16.0	166	2¾	2¾	65.8	25	22	7.5	Pulp raw. Shives did not bleach.
B-172	New	Medium tow	2.7	7.2	21.5	57.0	8.0	21.3	166	2¾	2¾	....	Various amounts	....	11.3	Cook made in rag boiler.
A-173- 3	New	Straw	17.6	42.3	....	....	4.4	10.6	160	2	8	41.8	20	65	26.3	Pulp fairly well cooked.
A-166-12	Old	Medium tow	13.3	20.0	....	....	5.3	8.0	155	2	6	....	35	....	51.3	Pulp fairly well cooked.
A-174- 1	New	Medium tow	....	....	21.5	43.0	13.3	26.6	166	2¾	2¾	63.8	25	24	0	Pulp raw. Did not bleach.
B-171	New	Medium tow	....	....	21.5	45.0	13.3	26.0	166	2¾	2¾	....	Various amounts	....	13.9	Pulp raw. Did not bleach. Cook made in rag boiler.

† Color of pulp after bleach treatment. Hess Ives Violet = per cent white.

material one hour in 100 c.c. of solution of the concentration indicated.

Solubility in hot water. Boiling of material four hours in water.

Pentosans. Method reported by Schorger.[3]

Cellulose. Method of Cross and Bevan as reported by Schorger.[3]

Lignin. Method of Ost and Wilkening.[4]

The results of the tests are indicated in Table 1, in "flow-sheet" form, the sequence of the tests being indicated by their order in the vertical columns. The material for each test was the solid residue left from the preceding test. All results are expressed in units on the basis of 100 units of original material taken.

Composition of the Material

In the discussion under this head, only the tests of the bast and the shive separated are considered, since it is the characteristics of the separate entities that make up the straw in which we are interested and not the composit of the entire straw. The results of test of the entire straw, moreover, were somewhat contradictory and characteristic of analysis of small samples taken from heterogeneous material.

The results of the analysis are conveniently summarized in Table 2.

Fatty and waxy materials seem to occur in the shive to a larger extent than in the bast, and the difficulty in thoroughly wetting the shive in mild treatments is probably thus explained. On the other hand, the bast contains over twice as much water-soluble material as the shive. In addition to the carbohydrates usually found in plant material, much of this material is probably pectins originating in a partial retting of the pectoses by fermentation. The large amount of alkali-soluble material in the bast and not soluble in water would indicate pectoses still unaffected by fermentation. No minute study of these extracts was made, knowledge of them not being considered particularly pertinent to the fiber problem.

The easily hydrolyzable cellulose and pentosan groups are present in the bast to only a limited extent, while the shive contains large amounts. The same is true of the pentosan insoluble in alkali but rendered soluble by chlorine, the pentosan resistant to both alkali and chlorine and the lignin. The stable cellulose present in the bast in fact accounts for almost all the material not soluble in water or rendered so by ex-

[3] A. W. Schorger, Jr., Ind. Eng. Chem. 9, 556 (1917).
[4] Cross and Bevan, Researches on Cellulose, III, 89 (1905-1910), Chemiker Zeitung, 461 (1910).

TABLE 1—SCHEDULE SHOWING SEQUENCE OF TESTS, WITH FINDINGS
Expressed in parts per hundred of original bast, shive or entire straw taken.

ORIGINAL MATERIALS
Bast.....100 parts
Shive.....100 parts
Entire straw...100 parts

Which by analysis gave:

Soluble in Alcohol-Benzol	Lignin	Ash
Bast.....2.3	Entire straw....25.8	Bast.....4.7
Shive.....6.5		Shive.....3.5
Entire straw...3.7		Entire straw...6.0

Residues insoluble in alcohol-benzol by analysis gave:

Soluble in 1% NaOH	Soluble in hot water	Cellulose	Pentosan	Lignin	Ash soluble in water
Bast.....29.2	Bast.....11.1	Bast.....71.9	Bast.....6.0	Bast.....10.1	Bast.....2.8
Shive.....24.2	Shive.....5.1	Shive.....57.0	Shive.....25.6	Shive.....27.9	Shive.....1.3
Entire straw..32.1	Entire straw..9.9	Entire straw..51.3	Entire straw..19.4	Entire straw..24.2	Entire straw..2.1

Residues insoluble in 1% NaOH by analysis gave:

Residues insoluble in hot water, but soluble in:

Cellulose	Pentosan	Lignin	Alcoholic 1.4% KOH	Pentosans in the Cellulose
Bast.....67.2	Bast.....2.8	Bast.....2.9	Bast.....13.9	Bast.....2.4
Shive.....47.1	Shive.....18.3	Shive.....34.1	Shive.....12.9	Shive.....11.4
Entire straw..48.5	Entire straw..12.3	Entire straw..15.8	Entire straw..15.1	Entire straw..8.2

Pentosans in the Cellulose
Bast.....2.1
Shive.....12.8
Entire straw..8.5

TABLE 7—Effect of various other combinations of chemicals on the strength of linen cloth.

Cook No.	Old or new cloth	Cooked with straw or tow	Chemical: Kind	Chemical: Per cent	Chemical: Grams per liter	Max. temp. °C.	Time: Hrs. to max. temp.	Time: Hrs. at max. temp.	Per cent yield of pulp	Per cent bleach powder	Color† of pulp per cent white	Per cent loss in strength of linen cloth	REMARKS
A-177a	New	Medium tow	Na_2CO_3	8.0	22.8	166	3	None	75.5	25	35	1.25	Very raw. Shives did not bleach
			Na_2SO_3	2.0	5.7								
A-176	New	Medium tow	Na_2CO_3	10.25	29.3	166	3	3	67.5	25	30	7.5	Raw. Shives did not bleach.
			Na_2SO_3	8.0	16.0								
A-177b	New	Medium tow	$Ca(CH'_3)_2$	20.0	40.0	166	3	6	85.3	25	31	35.0	Raw. Shives did not bleach.
			Na_2SO_4	38.4	76.8								
A-177c	New	Medium tow	$Ca(OH)_2$	20.0	40.0	166	3	6	67.0	25	29	33.8	Recook of A-177a. Pulp still raw.
			Na_2SO_4	38.4	76.8								
A-166-13	Old	Linen rags	$Ca(OH)_2$	5.0	12.0	130	1	11	....	12	....	0	A typical linen rag pulp.
A-175	New	Medium tow	$Ca(SH)_2$	15.0	30	166	3	6½	74.0	25	19	20.0	Pulp very black; could not bleach except with an excessive amount of bleach.
A-166-2	Old	....	Water only			140	¼	4½	....	....	....	0	
A-166-3	Old	....	Water only			155	½	4½	....	....	....	0	
A-166-4	Old	....	Water only			170	½	4½	....	....	....	23.5	

† Color of pulp after bleach treatment. Hess Ives Violet=per cent white

tremely mild hydrolytic treatments. In the shive, however, it amounts to less than the sum of the alkali and chlorine resistant pentosan and the lignin.

On consideration of the foregoing discussion the marked differences between the bast and the shive from the standpoint of chemical constitution are as great as their physical dissimilarity. In the bast it seems probable that we have a relatively very pure cellulose, adjacent to which or absorbed onto which are numerous substances very easily washed off by the action of organic solvents and dilute caustic soda solutions. In the shive, what cellulose is present, is closely combined with relatively large amounts of lignin and pentosans in about the same proportions in which they occur in dicotyledones such as the sugar maple.[8] The difficult problem that confronts the technologist in attempting the disintegration of the shive by chemical digestion may be realized upon considering that the cellulose of the bast is subjected from the very beginning to the action of the cooking liquors with little, if any, lignin or pentosans in close union to share the attack and reduce its severity. Drastic action is required, however, if the shive with its cellulose linked with lignin and pentosan in relatively resistant combination is to be disintegrated to the point that the residues may be either washed out or bleached. The problem is similar to what would be met if it were necessary to cook a charge of cotton fiber and maple chips together and completely pulp the maple without in any way injuring the cotton. Experience in the boiling of cotton or chemical wood pulps in either alkaline or bisulphite solutions similar to those used in pulping wood has demonstrated the succeptibility of the cellulose fiber to serious injury.

Strength Tests on Linen Cloth Subject to Typical Cooking Condition

After consideration of the chemical constitution of the component parts of the straw, the action of typical cooking conditions on the strength of the bast is of interest. Tables 3, 4, 5, 6 and 7 show the reduction in tensile strength of strips of unbleached linen cloth included with flax straw or tow in some typical cooks. The chemicals used and cooking conditions are indicated. The loss in strength of the bast may be gauged by the loss in tensile strength of the linen cloth cooked with the straw or tow. The degree of cooking is indicated by the yield of pulp obtained and by the per cent white, as measured on the Hess-Ives Tint Photometer, of hand sheets made from the pulps after bleaching with the amounts of bleaching powder specified.

A study of the data presented develops the following facts:

Treatments with water at temperatures up to 155°C. produced no apparent weakening of the bast fiber.

Similar treatments at 170°C. weaken the fiber 25 per cent.

Treatments with caustic soda produced marked weakening of the fiber.

The weakening effect was intensified by increased concentration or increased temperature.

Prolonged cooking at constant temperature after the active caustic soda had been exhausted did not further weaken the fiber.

Cooking with various combinations of caustic soda and sodium phosphate produced marked weakening of the fiber if sufficiently drastic to cause adequate softening of the shive.

Cooking with various combinations of caustic soda, sodium sulphite, and sodium sulphide produced marked weakening of the fiber if sufficiently drastic to cause adequate softening of the shive.

Cooking with any combination of chemicals or conditions indicated in the tables produced marked weakening of the fiber if sufficiently drastic to cause adequate softening of the shive.

Digestion with milk of lime under conditions commonly used in paper mills produced no apparent weakening of the fiber but was not sufficiently drastic to cause anywhere near an adequate softening or distintegration of the shive.

[8] Ritter and Fleck, Chemistry of Wood, V., Results of Analyses of Some American Woods. Jr. Ind. and Eng. Chem. 14, 11, 1050, Nov., 1922.

General Conclusions

The chemical dissimilarity of the bast and the shive occurring in straw from flax grown for seed purposes is so great that common pulping methods are not at all suitable for disintegration of the shive without marked weakening of the bast fiber.

That chemical methods exist which are capable of pulping the shive without weakening the bast has not yet come to the attention of the writers.

It seems probable that only by a combination of extremely mild pulping processes with mechanical separation in several steps can the problem be solved.

In any of the treatments the weakening of the bast at temperatures above 155°C. is more marked than at lower temperatures.

Regulating the Cooking Process

By B. H. MOERBECK

(Translated from Der Papierfabrikant)

TO OBTAIN a uniform product from the manufacturing process is one of the most important, if not the most important, problems of the manufacturer of sulphite pulp. Furthermore, it is also one of the most difficult tasks that he has to perform. Hence, it is no matter of surprise to find the literature full of papers and studies on this particular subject, for most every sulphite mill is deeply interested in it or should be. The remarkable character of the work done on this subject is the great variety of the angles from which the subject has been tackled and investigated. The problem is one of many sides, and the conclusions that are drawn regarding it depend to a great deal on the standpoint from which the matter is considered. This alone will reveal to the reader the difficulties that surround this problem.

How the Problem May Be Considered

There are two fundamental bases on which consideration of this problem may rest. In the first place, attention may be paid to the raw material that is employed in the manufacturing operation and to the fact that its composition varies considerably, and, in fact, is unknown, speaking in a strict sense. This gives one basis for studying the problem, and another is the fact that there are still no methods of investigation and analysis that are available to the maker of sulphite pulp which will be able to give him a clear and concise idea of what cellulose is and how the different forms in which cellulose is found during the course of its conversion into pulp vary from one another in actual constitution. It is thus evident that when the exact character of material that one is working with is unknown, and it is difficult if not impossible to determine what the changes are that take place in it, it is a very difficult matter to make any changes in the pulp-making process with the end of obtaining a product of certain definite properties.

An examination of the literature will reveal that there are three different viewpoints that are taken in the consideration and discussion of this problem. One of these is that it is possible to develop an automatic cooking process. This is of American origin and counts among its supporters such well-known paper men as Allen and others. Then again there is the method of handling this problem which has been advocated by Dr. Klein and which is in direct opposition to the American method. The Klein method is based primarily on the employment of operators who are thoroughly skilled in the digestion process, and who are able to control the operations in such a manner that a product of uniform quality is always obtained, no matter how the original raw material may vary. In other words, this method rates primarily on the human element.

The problem of uniform digestion of sulphite pulp has also been considered from the standpoint that it will be impossible to achieve automatic control of the cooking process, but that investigations should nevertheless proceed so that the real character of the process may be revealed and enough information finally obtained to enable the cooking process to be conducted in a strictly scientific manner, with the aid of more or less skilled labor, thus avoiding the empirical methods that are employed so largely at the present time. In other

words, the third faction believes in a combination of both skilled labor and scientific control.

It is the intention of the writer to discuss these various viewpoints, but before doing so it is well to define in accurate terms the conditions and circumstances that govern the operation of cooking wood and that determine whether or not a pulp of uniform quality is obtained in the process.

Control of Wood Composition

It is natural that the first factor of importance in this discussion is the composition of the wood chips. It is of prime importance that the composition of the wood is as uniform as possible. Then again the composition of the wood mixture that is used in the process is of importance. It is not always possible to use wood all of the same composition. Woods containing different proportions of moisture, of different ages or of different origin, may have to be used and when the mixture is made, it should be done in a rational manner and with due consideration of the properties of the finished pulp. It should be definitely known how much of each kind of wood to use and how to vary the proportions according to conditions. Perhaps the most important factor is the percentage of moisture in the wood. That must always be under strict control. The amount of water in the wood must be carefully determined. It is suggested that this is done most rapidly by use of the petroleum distillation method. Furthermore, accurate control must be exercised over the lengths of wood chips that are fed into the digesters. Particular attention is given to this matter in the United States.

The Digestion Liquor

Another important factor is the control of the digestion liquor that is employed in the cooking process. The liquor should always be of the same strength. The lime content of the liquor is of especial importance and this must always be maintained constant, as it is often necessary to use wood in which the proportion of moisture varies greatly. Then again the temperature of the digestion process and the pressure of the steam must be maintained uniform throughout the operation.

It follows that were it possible to attain all these conditions in the proper manner under all circumstances, there would be no doubt but that the American method would give best results. But unfortunately, such is not possible in actual practice. Allen has advocated the use of steam in the digester in accordance with a definite curve in order to obtain the proper temperature within the cooker. This is claimed to be the safest and most rational way of solving the problem, for once the temperature is definitely controlled, the reaction will be properly guided.

In order to obtain this temperature curve, a recording thermometer must be employed. A steam meter will show the effect of addition of steam more quickly, but this instrument is expensive and of delicate construction and gets out of order rather quickly. Furthermore Allen employs the aid of an experienced operator in determining the correct time for the discharge of the contents of the apparatus, as it appeared to him to be quite certain that it will be impossible to predetermine the exact point where this should be done at the outset of the cooking process. Furthermore, it must be remembered that a successful cook depends on the man who is in charge of the digester knowing exactly when to end the digestion and to do so at once and blow the contents of the digester without delay. This is moreover an essential of the automatic digestion process. It is understood that this is not always possible and again it is not always desirable.

Use of Skilled Labor

Those who have had experience with the use of skilled labor in the digestion operation will substantiate the statement that such operation of the cooking process is fraught with inconvenience and the results are not very satisfactory at times. On the other hand, it remains rather doubtful whether it will be possible to do away with the use of all labor, that is skilled labor, in the cooking of pulp, no matter how automatic the operation may be made.

It therefore occurred to the author that there remained nothing to be done but to institute an investigation with the object of developing some method of scientifically and practically controlling the cooking process. The first step was clearly indicated to be the determination of an accurate and quick method of examining and establishing the properties of the pulp as made. The method which was found to be most suitable for this purpose has been described by Sieber in Zellstoff und Chemie 1922. The principle of this method is the consumption of chlorine by the pulp and the establishing of a chlorine consumption factory. This method was employed with certain changes.

Establishing the Chlorine Coefficient

The author used this method with success. He found it to be simple and accurate. There are certain important advantages that it possesses. But then again it is unfortunate that it does not give results which can be used in clearing this matter in its entirety. It is still wanting in certain respects. For example, it is possible to manufacture Mitscherlich pulp under such conditions, namely, at so slow a rate and at so low a temperature, that the chlorine consumption of the product is 15. But then, such a pulp will be much stronger and much slower than a rapidly digested, easy bleaching Ritter-Kellner pulp which also has a Sieber number of chlorine coefficient of 15. It is evident that in this case the method fails to distinguish between the two kinds of pulp.

Thorough Cooking of the Stock

An investigation was made to determine if the stock had been thoroughly and uniformly cooked in the digester, and to do this, a sample of the stock was taken from the top, the middle and the bottom of the cooker.

The digestion was effected with superheated steam and the stock was cooked by direct steam. The results of the investigation showed conclusively that the steaming of the stock had a bad effect on it. When the stock is digested in the normal manner, the pulp obtained should have a chlorine consumption of 40 to 50, an average of 43. In this case it was found that the sample of pulp taken from the top of the digester had a chlorine coefficient of 40 and that taken from the middle of the apparatus a Sieber number of 40 as well, while that taken from the bottom of the cooker had a coefficient of 60. The operation was repeated without steaming and it was established that the pulp from the top of the digester had a chlorine coefficient of 40, that from the middle of the apparatus a coefficient of 39, and that in the bottom of the cooker a coefficient of 36, which gave an average Sieber number of 38. Then again it was found that the stock was better digested and possessed fewer knotty parts and its color was whiter.

Rapid Cooking

The chlorine method was also found to be of advantage in determining the effect of rapid cooking. Samples of stock which had been cooked at too great a speed were found to give Sieber numbers between 40 and 60, and 23 to 26. Then the time duration of the cooking was increased, and normal results were obtained.

Other advantages were also possessed by this chlorine consumption method. In the old types of Mitscherlich digesters, effective distribution of the steam employed in the direct digestion of the stock, was indispensable. This was accomplished by the use of a copper tube which was perforated through its entire length. Such was particularly essential in the slow operation of the cooker so as to obtain good grades of Mitscherlich pulp.

In this investigation an average sample of the pulp obtained in each digestion was taken and the Sieber numbers of these samples were communicated to the foreman of the digester house. In this particular case the Sieber number of easy bleaching stock was not established but the chloride of lime consumption under conditions which were maintained as close as possible to those that exist in theory was found. The bleachability of the stock was told by means of a color test made with the aid of malachite green. The stock was controlled on the machine by moistening with a solution of chloride of lime. It was found the foreman becomes used to the Sieber method quickly and he soon is able to control the operation of the apparatus in this manner.

A practical application of this method is to decide which Sieber number the pulp should possess. Both the manufac-

turer of the pulp and the purchaser may come to an agreement on this point. Then the operation of cooking is carried out under the proper conditions of pressure and temperature so as to give a stock which will conform to the specifications. Careful record is taken of the temperature and the pressure by means of suitable recording instruments. On the average, normal pulp will have a Sieber number of from 30 to 40, strong pulp from 50 to 60. The Sieber numbers will then tell very rapidly and conclusively if the pulp has been digested too hard or too soft.

The co-operation of the foreman of the digestion house is essential. He is generally paid a bonus for getting the correct results. Then again the use of recording thermometers is also a distinct aid in the control of the operations. The author has had personal experience with a certain plant in which this method was employed in a practical manner and it was found that about thirty percent of the cooks were carried out correctly and about seventy percent were incorrect. But after the system had been in use for several months and the men had become acquainted with its application, the percentage of good digestion increased to 79 percent. It is singular that those foremen who were most experienced in the old method of controlling the sulphite digestion operations were also the ones who obtained the best results by the aid of the new method.

It is a fact that this method possesses certain disadvantages. It is not an absolutely automatic method, for it requires the use of experienced foremen to take charge of the cookers and to tell the point at which they should be blown. Nevertheless the method does possesses important advantages and real value. Then again it was found that it would be to no advantage to change the methods that are employed at the present time for the analysis and control of the digestion liquor and the methods that are employed in making it. The ones that have been used heretofore seem to be entirely satisfactory. Furthermore, it was concluded that there was no real use in trying to determine the endpoint of this digestion by making analyses of the digestion liquors. There are too many factors involved in this matter and it is undoubtedly inadvisable to determine all these chemical factors with mathematical accuracy. Then again the time at which the operations of digestion ends is quite indeterminate, for the reason that when the liquor is permitted to flow out of the digester, the next step is to allow the stock in it to cool off and then finally the digester is emptied. It is, therefore, evident that the time of completion of digestion is approximate.

Problem Still Unsolved

Thus the problem is still in the unsolved state. There is therefore no method by which it is possible to determine the real relation that exists between the digestion process and the product that is manufactured by it. There is no accurate and scientific manner in which can be defined the connection between the raw materials used in digestion and the pulp that is obtained from them. For example, what is wanted is a method of the character that is employed in determining the effect of the beating operation or the one which controls the dehydration of the stock on the wire on the paper making machine. That there is need for such method, no one will doubt, and it is suggested to the paper technologists that are interested in this phase of the paper making process that they do some work on the subject with the purpose of developing a method which will be better able to state the relationships between the factors involved in digestion so that the operations may be more effectively controlled.

Product of Many Mills Is Being Changed

A. R. Graustein, president of the International Paper Co., in a discussion of paper trade conditions recently declared that American paper mills cannot compete with the cheap wood supply and continuous water power of Canadian mills and predicted that a large part of the American newsprint industry would eventually be transferred to Canada. The American plants, he said, will have to be diverted from newsprint production to other varieties of paper.

A survey of the paper industry of northern New York bears out this statement and shows that already many mills formerly making newsprint have gone into the manufacture of specialties. At present the mills which are sticking to the manufacture of newsprint in northern New York are the Oswegatchie Paper Co., at Governeur; The DeGrasse Paper Co., at Pyrites; the Algonquin Paper Co., at Ogdensburg; The Gould Paper Co., at Lyons Falls; the Hanna Mills, at Norfolk, Norwood and Raymondville, and the St. Regis mill at Deferiet, which operates two machines on newsprint and have recently put two machines on catalogue paper. The St. Regis Paper Co. has for some time been contemplating a mill near Quebec under the St. Regis Paper Co., of Canada, which holds large timber tracts in that section. In the Hudson river vicinity, the International Paper Co. is running two machines on newsprint at the Glens Falls mill, ten machines at the Corinth mill, and at the Fort Edward mill three machines are on newsprint and two on kraft paper.

The St. Regis mill at Black river is now making wrapping paper and packers' wax. The Sherman Paper Co. mill, at Great Bend, has gone over to the manufacture of half tone and its Felts Mills' plant is manufacturing colored news, both of which may be classed as specialties. The West End Paper Co., of Carthage, is still manufacturing some newsprint but has gone over partially to the production of specialties. The Champion Paper Co., of Carthage, formerly a newsprint mill, is now producing catalogue paper. The National Paper Products Co., also of Carthage, is making tissue and the Island Paper Co., of the same village, is turning out wrapping paper. In the Watertown section, the Taggart Bros. Co. is manufacturing jute bags at the Watertown mill and is converting the Herrings mill, recently purchased from the St. Regis Co. into another bag mill. This mill formerly produced cardboard. The Brownsville Paper Co. is making lightweight bond paper and cash register paper; the Harmon Paper Co., at Brownsville, is making wall paper. At Dexter, N. Y., the Dexter Sulphite Co. is turning out wrapping paper and the Warren Parchment Co. is making glassine paper. The Racquette River Paper Co., at Potsdam, is devoting its attention to the manufacture of specialties.

Since the closing of the International mills at Glen Park three mills making newsprint exclusively have been removed from the northern New York section and papermakers look for the ultimate removal of practically all newsprint mills from northern New York and the further development of the specialties industry in this section.

I. P. Co. Experimenting at Fort Edward

At the Fort Edward mill of the Internation Paper Co., five of the six machines are running, three on newsprint and two on kraft. The pulp mill which had been idle for some time is again operating with eight of the nine grinders running on ground wood pulp. All the beaters are now working for the machines making kraft and it is understood several more beaters will be installed in anticipation of operating the one machine now idle on kraft at a not distant date. This machine it is said will be started soon but whether on kraft or newsprint seems to be in doubt.

Experiments are now being made at the sulphite mill but the possibility of this plant again being operated is said to be in doubt. A faster product known as brown pulp has been made recently during experiments and this, it is said, if the experiments turn out satisfactory, might be used for No. 2 kraft. In that event the sulphite mill may again be started, it is stated.

For the first time in fifty years there was no log drive on the Schroon river. In neither the Schroon nor the Hudson rivers were logs floated this year. During the last year virtually all of the timber cut in the Warrensburg section has been pulpwood which was shipped by railroad. The Schroon River Pulp & Paper Co., of Warrensburg, this year received all pulp wood by rail. This company this year cut 50,000 cords of pulp wood.

The Industrial Works, Bay City, Mich., manufacturers of locomotive cranes and crane equipment for more than a half century announce the opening of two new district offices, one at 425 Whitney Central Building, New Orleans, La., in charge of John A. Abele, district sales manager, and the other at 843-A Hurt Building, Atlanta, Ga., in charge of John J. Murphy, district sales manager.

Superintendents Organize Southeastern Division

ORGANIZATION of the Southeastern Division of the American Pulp and Paper Mill Superintendents' Association was effected at an initial meeting of superintendents and managers held in Richmond, Va., April 23-24, officers being chosen as follows: Carl Magnus, superintendent of Mill No. 3, Standard Paper Manufacturing Co., Richmond, chairman; J. P. Eckberg, general manager of the Chesapeake Corporation, West Point, Va., first vice-chairman; J. H. Thickens, general manager of the Mead Fibre Co., Kingsport, Tenn., second vice-chairman; W. S. Sprang, superintendent of the Champion Fibre Co., Canton, N. C., third vice-chairman; J. A. Ramsey, of the Bedford Pulp and Paper Co., Big Island, Va., secretary and treasurer.

The division includes Maryland, Delaware, District of Columbia, Virginia, North Carolina, and parts of Pennsylvania, West Virginia, Tennessee and South Carolina. It is the tenth division of the association to be formed. It is planned to hold meetings once a year and oftener if found practicable.

Following the election of officers on the afternoon of the first day of the convention, a rising vote of thanks was accorded Mr. Magnus and other members of the committee on arrangements for the excellent program that was arranged. Mr. Magnus was chairman of this committee. Other members were: M. J. Guild, Albemarle Paper Manufacturing Co., Richmond, vice-chairman; J. A. Ramsey, Bedford Pulp and Paper Co., Big Island; Joseph Ryeberg, Hummell-Ross Fibre Corporation, Hopewell; Albert D. Woods, Champion Fibre Co., Canton, N. C.; Henry Schuh, Carolina Fibre Co., Hartsville, S. C.

The convention opened with a business session the morning of April 23 and concluded with a banquet at the Richmond Hotel the evening of the second day.

After Milton E. Marcuse, president of the Bedford Pulp and Paper Co., had extended welcome in behalf of the paper industry of Richmond and contiguous territory, R. L. Eminger, of the Miami Paper Co., Miamisburg, Ohio, chairman of the organization committee of the American Association, took charge of the meeting. John H. O'Connell, of the Diana Paper Co., Harrisville, N. Y., another member of this committee, who is a past president of the national organization, made a brief talk, stressing the benefits to be derived from mutual co-operation and concerted effort. Incidentally, he commented upon the fact that he left more than a foot of snow on the ground up in his home state and found mid-summer weather when he arrived in Richmond, mopping his brow as he drew a comparison between the weather conditions. The torrid weather, however, did not prevent the 100 or more paper men attending the convention from enjoying themselves thoroughly during their stay in the capital of the Old Dominion.

Address on "Aims and Purposes"

In a paper on "Aims and Purposes of the Superintendents' Association," Edward T. A. Coughlin, of the New Jersey Coated Paper Co., of Montclair, N. J., stressed the value of the American Association as an educational medium for imparting new and better ideas in use in the industry.

"We can all benefit by the experience of others, if we only would," he said. "Not a man here today can say that this thought has never entered his mind. 'If I had only known better, I would never have done that.' It is an honest confession to himself that he was deficient either in knowledge or experience. He might have forestalled his mistake or error with wise counsel. Mature minds of mature men should seek this counsel. We possibly forgive mistakes of youth but not of grown men. It is a pity to note, actually criminal to realize, the enormous waste in duplication of effort along certain lines —waste of time, money, material and men. Cannot this be lessened by the counsel of experience? It can be reduced to some extent by the experience of others." Mr. Coughlin, who is first vice-president of the American Association, made a distinct hit with his paper.

In the course of it he suggested that after the organization of the Southeastern division was perfected, various specialized committees might be appointed, such as (1) Technical Control; (2) Cost Relations; (3) New Machinery and Processes; (4) Conversion Problems; (5) Power, Light, Heat and ventilation; (6) Safety First. "These committees should be appointed with a real live chairman at the head of each, their duties consisting of rendering progress reports as often as possible," he said.

"Use of White Water," Subject of Paper

F. K. Becker, of the Bird Machine Co., South Walpole, Mass., also presented a paper at the opening session, the subject being "Use of White Water in Paper Mills."

Aside from other benefits accruing from it, he stressed the effectiveness of the use of white water in preventing stream pollution.

"Treating white water only to prevent stream pollution," he said, "is an expensive thing. Treating white water so as to employ it in our mills is profitable, and in making money for ourselves we have solved the problem of polluting the stream.

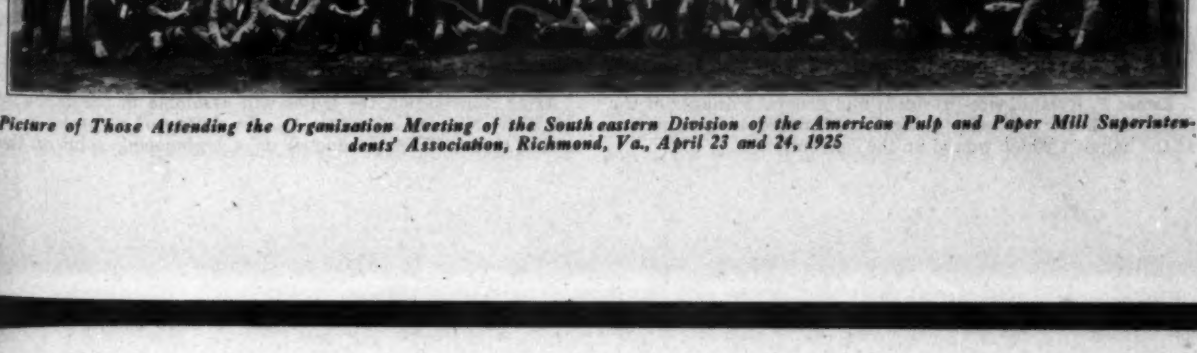
"The real point about water purification from the angle of pollution," he added, "is that since we have to do it or will have to do it, then it behooves us to do it on the most profitable basis.

"No matter what may be said against it and what has been tried before without success, white water can be used. Common sense tells us that it can be used, and the experience in the case of enough mills to prove anything tells us that it can be used. The question is, are we willing to undertake it, overcome the obstacles, and make things go?"

Farnsworth Talks on "Drying of Paper"

F. C. Farnsworth, president of the Farnsworth Co., Providence, R. I., illustrated a paper on "Paper Drying and Steam Economy in Paper Mills" with stereopticon views.

"With the proper drying system, condensation pumps and boiler feeding system," he said, "no loss of production need



Picture of Those Attending the Organization Meeting of the Southeastern Division of the American Pulp and Paper Mill Superintendents' Association, Richmond, Va., April 23 and 24, 1925

prevail, and yet all condensate can be handled directly into the boilers with no heat loss, except possible radiation losses, and those can be remedied to a minimum by proper insulation."

Mr. Farnsworth pointed out that many new mills are being erected and everything points toward conditions whereby it will be a matter of the survival of the fittest with the result that if the older mills are to exist they must adopt modern methods, equipment and scientific management.

"If any mill can make more paper than it can dry, it is, then, very important to have the proper drying system for extracting all water and air and for making every inch of the drying surface of the paper machine produce the maximum capacity," he said.

Much interest was aroused by the paper and Mr. Farnsworth was plied with a number of questions pertaining to points which he stressed in it.

"The Curling of Fine Papers"

In a paper on "The Curling of Fine Papers," H. H. Hanson, of the Eastern Manufacturing Co., Bangor, Maine, outlined four causes for curling of machine-dried papers and one extra one for pole-dried papers. "It is safe to say that these causes for curling are nearly present in the paper to some extent," he stated. "The print-shop condition exists regardless of what the papermaker can do, and he cannot help getting some two-sided sizing and probably some two-sided formation. If this is so, then, why doesn't all paper curl? The answer is threefold. In the first place, these causes for curling can be reduced to a minimum by careful operation; secondly, we have the factor of coherence, through which the causes act; and thirdly, there are at least two operations of the machine which counteract curling."

"Power Costs in Paper Mills"

W. S. Spratt, general engineer of the Westinghouse Manufacturing Co., Pittsburgh, read a paper on "Power Costs in Paper Mills"; and R. B. Adam, of Stowe & Woodward Co., Newton Upper Falls, Mass., presented a paper on "Rubber Press Rolls."

In discussion of this paper, E. H. Neblett, superintendent of Mill No. 1, of the Standard Paper Manufacturing Co., pointed out that Richmond mills were losing much time sending their rolls up north to be ground. He wondered if some way could not be found to have the work done without such loss of time. Usually, several weeks are lost in sending rolls away, he said.

Local Grinding of Press Rolls Practical

Mr. Adams said that there was no reason in the world why the work should not be done in Richmond. A roll grinder would not cost a great deal, and it was easy enough to train a man to operate it. He suggested that a young man with an abundance of common sense and some degree of adaptability be picked from one of the Richmond mills and sent up to his plant, where instruction would readily be given. It would take only a few days to train him sufficiently to start work.

Mr. Adams suggested that one roll grinder would do for a starter, and there was possibly enough work in and around Richmond to keep two going later on.

Luncheon and Mill Visits

A luncheon given the delegates the first day of the convention was featured by a talk by Robert S. Crump, president of the Standard Paper Manufacturing Co. Mr. Crump traced the history of paper making from ancient times down to the present day, showing the various developments of the industry.

A special entertainment program was arranged for the evening of the first day incident to a dinner at the Richmond Hotel, hosts of the occasion being the following: Albemarle Paper Manufacturing Co., Standard Paper Manufacturing Co., Bedford Pulp and Paper Co., Manchester Board and Paper Co., Hummell-Ross Fibre Corporation, Chesapeake Corporation.

The afternoon of the second day was spent in visiting plants and points of interest in the city.

Convention Closed with Banquet

James F. Ryland, vice-president and general manager of the Standard Paper Manufacturing Co., officiated as toastmaster at the banquet which wound up the convention.

H. W. Ellerson, president of the Albemarle Paper Manufacturing Co., one of the speakers, gave a number of hints and suggestions as to the way to handle any business, and the paper industry in particular. He also gave the assembled superintendents some good suggestions. "Ideal relationship between the heads of departments and the operatives can only be achieved through frank and honest co-operation with the human instinct of justice and fellowship predominating," he said. "The best head of a department, executive or administrative, may be obtained from the men who have gone through the mill themselves and served their apprenticeship. A successful man is the one, in the most cases, who knows his business. Therefore the man who has grown up in it, without theory, but with practice, will prove the most valuable not only to himself but to the business as well.

"Character is the prime essential. Men with character working together can accomplish much. An ideal head should have served his apprenticeship and gone through the entire program in a practical way."

L. D. Post, publisher of the Paper Mill and Wood Pulp News, New York, another speaker on the program, pointed to the dangers of foreign competition in his talk. He also declared that from his personal observation he was satisfied that within a decade the South would be the center of the manufacturing industry, particularly the paper manufacturing business of the United States. He warned the manufacturers not to go into unwarranted expansion. Let the supply meet the demand, but do not overproduce, he cautioned.

Allen J. Saville, former director of public works of Richmond, showed that the South, with its natural advantages, is fast coming into its own, supplying the world with manufactured goods, grown on the spot, and turned into the product with home-loving and loyal labor working under weather conditions unequaled anywhere on earth.

For his interest displayed in the convention, Mr. Saville was presented a meerschaum pipe at the conclusion of his speech. Mr. Post was the recipient of a fountain pen.

Program of Superintendents Sixth Annual Convention

The sixth annual convention of the American Pulp and Paper Mill Superintendents' Association will be held on June 4, 5 and 6, 1925, at Niagara Falls, New York, with headquarters at the Hotel Niagara.

Following is the program, which is scheduled on Eastern Standard Time:

Thursday, June 4, 1925

Morning

8:00—Registration at headquarters, Hotel Niagara. All meetings at K. of C. Auditorium, one block east of hotel.

9:00—Invocation, Rev. P. W. Mosher; opening address, President Nelson R. Davis; address of welcome, Mayor Wm. B. Laughlin; response, Fred J. Rooney; humanics and organization development, John S. Schumaker; apprenticeship and educational problems, Harry E. Weston.

Noon

12:30—Luncheon at Hotel Niagara.

Afternoon

1:30—Pulverized fuel, W. C. Heckeroth; power problems, R. W. Leeper; bonds, writings and fine papers, W. D. Sommerville; future of the industry and forestry, Dr. Hugh P. Baker, Secretary of the American Paper and Pulp Association; straw and coarse papermaking, H. G. Funsett; moving pictures of engineering problems, Geo. S. Anderson, Publicity Director of The Niagara Falls Power Company.

Evening

7:00—Annual dinner at Hotel Niagara, sponsored by the Industries of Niagara Falls; toastmaster, John J. White; address, Norman W. Wilson, President of the American Paper and Pulp Association; address (psychology of laughter), Chas. M. Newcomb; address, A. Monro Grier, President of the Canadian Niagara Power Company.

Program for the Ladies

After registration the ladies will assemble in the lobby of the Hotel Niagara at 9:30 a. m. In charge of a special committee they will be conducted on a sightseeing tour of the

State Reservation at Niagara and the various points of scenic beauty on the Canadian side.

Luncheon will be served them at the Hotel Clifton, Niagara Falls, Ontario, at 12:30 p. m.

They will then visit the miniature falls at The Niagara Falls Power Company, and the Shredded Wheat Company, returning to the Hotel Niagara to prepare for the dinner at 7:00 p. m.

Friday, June 5, 1925

Morning

9:00—Continuous grinding, American Voith Contact Co.; Waste, B. T. McBain; recording devices, Tom Harvey; paper-making problems, Homer H. Latimer; asbestos dryer felts, H. N. Hill Co.; newsprint paper in North America, R. S. Kellogg, Secretary of Newsprint Service Bureau.

Noon

12:30—Luncheon at Hotel Niagara.

Afternoon

1:30—Business and economics, A. T. Simonds; ground wood pulp, Adolph F. Meyer; yield per cord of various woods in the sulphite process, G. J. Armbruster; waste water problems in news mills, Vance P. Edwards; election and installation of officers.

Evening

7:00—Dinner at Hotel Niagara, sponsored by the Industries of Niagara Falls; variety of entertainment.

Program for the Ladies

Ladies will assemble in the lobby of the Hotel Niagara. In charge of special committee, they will be transported by busses to Youngstown, N. Y., for a tour of inspection through historic Fort Niagara.

Returning, they will stop off at the Niagara Falls Country Club where luncheon will be served them at 12:30 p. m.

They will visit the Spirella Co. and the Niagara Wall Paper Co. during the afternoon, then return to the Hotel Niagara for a private dinner and theatre party in the evening.

Saturday, June 6, 1925

A trip around Niagara Gorge will be made in special cars and all visitors desiring to make this trip will assemble at the Hotel Niagara at 8:30 a. m. This trip embraces the entire Niagara Gorge and points of interest on the Canadian side.

Upon returning, the visitors will be conducted on a trip of inspection through the various industries on the Canal Basin, including the Niagara Falls Power Co., Niagara Wall Paper Co., and the Cliff Paper Co.

Luncheon will be served at the Hotel Niagara at 12:30 p. m.

After luncheon, transportation will be available at the Hotel Niagara enabling those who desire, to visit the various industries in Niagara Falls. A complete list of the industries open for inspection, and their products, is posted in the lobby of the Hotel Niagara. Arrangements have been made for visiting these industries and the display of badges will admit the visitors.

A. P. W. Paper Co. Starts New Machinery

The A. P. W. Paper Co., of Albany, New York, who, aside from being the originator of the roll form of toilet paper, are the largest converters and operate the largest mill in the world devoted exclusively to the manufacture of toilet tissue and towel paper, have installed their ninth paper machine in the Liberty mill.

The new machine, which was started recently, has several interesting features which have attracted considerable attention. The machine was designed by the late W. S. Crandell, who was the general manager of the company, and has a number of features developed from his many years of successful operating experience. Although Mr. Crandell did not live to see the machine completed, the fact that he designed and built well was shown in the manner in which it was started. Paper was turned out the first day of operation and production continued without any serious delay.

The Sandy Hill Iron and Brass Works, of Hudson Falls, New York, furnished the machine which has one cylinder and trims 84 inches. Running at 400 feet per minute, 4¾ tons of 9-pound toilet tissue are produced in twenty-four hours. A Millspaugh suction press roll is installed at the wet end. Following the present tendency, all of the rolls, including the dryer cylinders, are mounted on either ball or roller bearings. Roller bearings are used where heavier duty is required on

84-Inch Cylinder Machine Making Toilet Tissue, Built by The Sandy Hill Iron and Brass Works, Hudson Falls, N. Y. All Rolls Equipped with Either Roller or Ball Bearings. Cleveland Worm Gear Individual Units on Each Dryer.

the presses and calenders, while the others are equipped with ball bearings. Only 30 horse power is required to drive the entire machine, which is supplied by a direct connected motor. Speed variation is obtained by a bevel friction drive on the main shaft, thus eliminating all belting. There are ten 36-inch dryer cylinders, each equipped with an individual worm gear reducing unit supplied by the Cleveland Worm and Gear

New Machine in A. P. W. Paper Co., Albany, N. Y., showing Cleveland Worm Gear Units on Each Dryer.

Co. in place of the usual spur gear, thus making the machine very quiet and smooth running.

The layout of the beating equipment as well as the equipment itself is particularly unique. The pulp is fed continuously into a 1,500-pound Downingtown Beater, passes through a Girley triple extractor into a Bauer Bros. refiner, and from there through the Jordan. From the Jordan, the stock goes directly to the machine-head box. No stock chests are used and consequently no stock is stored ahead of the machine. If any adjustments are required to change the quality of the stock on the machine, these can be made to take effect almost immediately without waiting to empty a chest. The operation of the beater is continuous, giving a very uniform stock.

The equipment is all on one floor and at the end of the machine room, which has no basement. Any excess of white water passes through a Bird save-all located near the beater in a position where it is easily taken care of.

All of the water used in the mills is taken from wells and has been proven by repeated analysis to be of superior quality for drinking purposes and is free from the slight contamination of vegetable matter in the river water. This results in the absence of formation of slime, throughout the process during all seasons.

Community Work at The Champion Fibre Co.

ALTHOUGH it is rather uncommon not to find some sort of community work carried on in connection with most of the larger paper mills, particularly those located in more or less isolated points, this work is seldom carried on as extensively with the spirit of genuine co-operation as at The Champion Fibre Co. in Canton, North Carolina. This work at Canton is carried on under the direction of the organization of a modern Y. M. C. A., which is the community center of the town.

In 1918, Mr. Thomson, the president of the company, realized that in order to obtain and keep the best class of help, it was necessary to make the town an exceptionally desirable place in which to live, and accordingly built a Y. M. C. A. building to serve as a community center that would do credit to a much larger city. He persuaded a secretary from Hamilton, Ohio, to go down there to organize the work, and in due time the modern building with swimming pool, gymnasium, bowling alleys, library and club room was completed and dedicated in May, 1919.

The board of directors is composed mainly of Champion Fibre employees with a maximum of three townsmen. The activities are in the direct charge of Mr. W. E. Jones, the general secretary, who has as assistants a secretary in charge of physical training, a women's secretary, a desk secretary, and a man in charge of the locker room.

The activities of the Y. M. C. A. comprise educational courses for foremen and superintendents, a lyceum entertainment course, physical training, Hi-Y Club, mill Bible classes, and co-operation with safety work and other mill activities. The club rooms serve as meeting places for other organizations in the town, the Women's Club, church clubs, and work in connection with the safety program in the mill.

Not the least important of these various activities are the educational courses which are in charge of Mr. A. D. Wood, the sulphite superintendent, who is the chairman of the educational committee. Evidence of the interest taken by the men in this work is shown in the accompanying statistical report for the month of January, 1925. During the month the total attendance in the classes was 836. It is hardly necessary to emphasize the value of this systematic training to promote co-operation, efficiency and safety to the employers as well as the employees. The classes meet on mill time for an hour each day and include training for foremen, assistant superintendents and superintendents, blue printing and drafting, paper making, shop arithmetic, stenography, and steam plant practice. These classes are in the direct charge of Mr. J. A. Spawn, the educational director, with the mill superintendents acting as instructors.

A recent enterprise of the educational committee was the sponsoring of the lyceum entertainment course. This course includes five numbers during the season furnished by such well known entertainers as the Criterion Male Quartette, a troupe of Shakespeare players and others. The expenses of the course are covered by selling season tickets for $2.50 each,

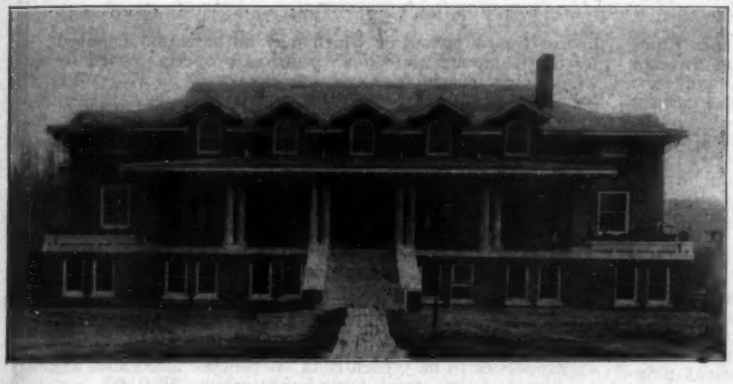
A CHAMPION GET-TOGETHER MEETING

Where day men, room foremen, shift foremen, superintendents, managers and stockholders meet and discuss mill problems

which gives the entire course for the price of a single similar entertainment in a larger city.

Physical training is in charge of Mr. Harmon More, the physical director. A regular schedule of classes is maintained so that all of the members, men, women, boys and girls, each have an appoinnted time for the use of the gymnasium and pool without friction. Basket ball during the winter months claims the most interest of any of the sports. Three teams are maintained, representing the mill, "Y," and school, which hold their own against other teams in the vicinity. In the summer a baseball team is supported. Other minor sports, volley ball, tennis and bowling, also claim their share of attention.

The religious activities consist of two Bible classes that meet once a week in the mill during the noon hour. These classes are regularly organized with officers elected. The boys have meetings Saturday mornings when men from all walks of life are invited in to talk on success in various lines. The Hi-Y Club, which was recently organized, has 17 members. This is an organization of high school boys having a slogan of clean speech, athletics, and scholarship.



THE INDUSTRIAL "Y" BUILDING

Now the community center of Canton

Additional features of the Y. M. C. A. are a circulating library of 1,000 books, which is maintained for the members, and a museum of natural history containing a collection of shells and minerals.

The price of the yearly membership is $10.00 for men and $5.00 for women, while the rates for mill employes are $6.00 and $3.00, the company paying the balance.

Taken all in all, the organization is an excellent example of an investment in good will that has incidentally brought financial returns in maintaining quality of workmanship and keeping down labor turnover.

CHAMPION Y. M. C. A. STATISTICAL REPORT FOR JANUARY, 1925

Membership at beginning of month	1,056
Expirations during the month	40
New Members and Renewals	101
Present Membership	1,121
Foremen Groups (12)	148
Safety First Meetings (4)	31
Committee Meetings (7)	62
Educational Classes—	
Blue Print and Drafting (8)	42
Paper Making (9)	111
Shop Arithmetic (4)	15
Stenography (5)	28
Superintendent Training (4)	51
Assistant Superintendent Training (8)	74
Foreman Training (20)	447
Steam Plant Practice (7)	68
"Y" Board Meeting (1)	12
Meetings with Mr. Robinson (3)	63
Parent Teacher Association (1)	24
Women's Club (1)	45
Men's Bible Class in Mill (8)	349
Boys' Bible Class in Building (4)	97
Methodists' Brotherhood Meeting (1)	48
Missionary Meetings (2)	47
Baptist Church Party	225
Banquet to Employees for Safety Record	252
Foremen's Club Banquet	63
Parties (2)	79
High School Orchestra Rehearsal	5
Number Playing Pool	1,322
Number Books Read	250
Family Night Movies (5)	2,226
Davies Opera Company, Lyceum Number	220
Number Basket Ball Games (10)	2,730
Number Games Bowled	204
Number Games Volley Ball in Mill (102)	587
Number Using Gymnasium—	
Men	264
Women	46
Girls	342
Boys	431
Number Games Horseshoe Pitching in Mill (194)	160
Number Towels Used During Month	1,842
General Building Attendance—Daily Average	455

The American Tissue Mills Benefit and Social Club at Holyoke, Mass., a mutual benefit and social organization of that company, held its annual election recently. David Whalen was elected president; James Norton vice-president; James Dean secretary, and Kenneth Burnett treasurer.

Dayton-Dowd Co., manufacturers of centrifugal pumps, Quincy, Ill., have recently opened a new office in Detroit at 841 David Whitney Building, in charge of Mr. E. E. Maher and Mr. E. P. Johnson. They have also appointed the Power Equipment Co., 131 State street, Boston, a new sales representative for the New England district.

New Catalogs, Booklets, Etc.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.—"The Dyeing of Paper," prepared by John R. Roberts, is a valuable edition of recent copyright, the object of which is to give in a general way information regarding the dyestuffs most generally used on paper which will aid in their selection and use. A brief description of the various kinds of paper is given, the different processes or methods of dyeing and the laboratory procedure used in testing dyestuffs and matching shades. Samples of colors comprise a large portion of the book, with the amounts indicated to use with a given finish. While the book is of great value to any paper mill executive, it is particularly so for students, beatermen, foremen and others who in time will become superintendents or managers of mills.

Gardco Paint Products Co., 53 W. Jackson Blvd., Chicago.—Bulletin No. 52 shows available colors and gives directions for the application of Gardco Concrete, Cement, Floor and Wall paints.

The Hill Clutch Machine & Foundry Co., Cleveland, O.—Bulletin No. 112 illustrates and lists the Cleveland Type Hill Collar Oiling Bearing of their latest design, which is a development and improvement of the older Standard Type.

Link-Belt Company, 910 So. Michigan Ave., Chicago.—An interesting book describing Link-Belt Rivetless Chain replete with illustrations, has just been published by that company. The book portrays in a pleasing manner the assembly and dissembly of this simple chain, which has only three parts. The text matter is supported by tables of weights and strengths, and describes many of the uses to which this chain can be put.

Mason Regulator Co., Dorchester Center, Boston, Mass.—General Catalogue, No. 62, has just been issued by this company, in a convenient size for desk filing. The book contains the illustrations and descriptions of a number of new pressure regulators, manufactured by this company, and shows various styles of lever and outside-spring operated regulators which cover the field for practically every condition. A new line of small regulators for air and water are also shown, and the catalogue gives full details of their Hydraulic Regulator which is the latest word in sensitive and accurate control. Their line of balanced valves has been further extended, and now covers in addition to their well-known extra heavy styles, a complete line for pressures up to 125 lbs. A series of accurate tables showing the capacity of reducing valves under varying conditions, forms a valuable adjunct to the catalogue.

Republic Flow Meters Co., 2240 Diversey Parkway, Chicago.—This company has just issued a new Pyrometer catalogue which is about as complete a piece of literature of its kind that can be found. Republic Pyrometers, with their progressive features of greater ruggedness, reliability and accuracy, prove themselves ideal boiler room instruments for measuring flue gas and boiler last pass temperatures.

New Issue

$16,000,000

Minnesota and Ontario Paper Company

First Mortgage Sinking Fund 6% Gold Bonds, Series A

Dated April 1, 1925. Interest payable April 1 and October 1 without deduction for Federal Income Taxes now or hereafter deductible at the source, not in excess of 2%. Principal and interest will be payable at the holder's option either in United States gold coin at the office of The Minnesota Loan and Trust Company, Trustee, Minneapolis, or at the offices of Halsey, Stuart & Co., Inc., in Chicago and New York, or in Canadian gold coin at the offices of The Dominion Bank in Toronto, Montreal, St. John, Winnipeg and Vancouver. Coupon bonds, denominations $1,000, $500, $100.

A letter from Mr. E. W. Backus, President of the Company, is summarized as follows:

THE COMPANY: Minnesota and Ontario Paper Company, operating manufacturing plants direct and through subsidiaries at International Falls, Minnesota, and Fort Frances and Kenora, Ontario, ranks among the largest newsprint paper manufacturers in the world. Modern ground wood, sulphite and paper mills are owned and in connection therewith extensive hydro-electric and hydraulic power generating plants; also a sulphate (Kraft) pulp mill, Insulite mill, saw and planing mill plants, box, crating and shook factories, railroads and logging spurs and equipment.

The timber supply in Minnesota and Ontario contiguous and tributary to the mills embraces a forest area of approximately 50,000 square miles and contains an almost inexhaustible supply of spruce pulpwood and other paper-making woods, while the actual holdings in Minnesota and Ontario are reliably estimated to contain sufficient pulpwood to keep the paper mills, including the contemplated additional capacity, in operation for over fifty years and the sawlog timber to keep the saw mills in operation over twenty-five years.

SECURITY: These bonds, together with any hereafter issued under the restrictions of the Mortgage, will be secured by a direct or collateral first lien on all the physical property now owned or which may be hereafter acquired by the Company and on all physical property owned by its principal subsidiaries.

The balance sheet, as of November 30, 1924, giving effect to the present financing and the recent appraisals of the Company's fixed property discloses net tangible assets after deducting all liabilities except these bonds and net current assets of $60,741,459.61 and $12,033,980.07 respectively.

EARNINGS: Average annual net earnings of the Company during the five-year and eleven months period ended November 30, 1924, as certified by independent auditors, were $2,737,541.64 (after depletion, local taxes and liberal charges for maintenance and repairs, but before interest, depreciation, and income taxes). These earnings include no return on over $12,000,000 expended or being expended on properties to be presently in operation. Maximum annual interest charges on these bonds require $960,000. For 1925, net earnings, as above, are estimated at approximately $4,000,000.

SINKING FUND: In addition to the serial maturities the Mortgage will provide for a Sinking Fund which will retire and cancel, either by purchase or redemption, principal amounts of the bonds due April 1, 1945, sufficient to retire all of such bonds by maturity.

MATURITIES AND PRICES

Amount	Due	Price	Amount	Due	Price
$ 600,000	April 1, 1930	99½	$ 900,000	April 1, 1933	98¼
$ 800,000	April 1, 1931	99¼	$ 900,000	April 1, 1934	98⅛
$ 900,000	April 1, 1932	99	$1,000,000	April 1, 1935	98½

Amount	Due	Price
$10,900,000	April 1, 1945	98

A circular fully descriptive of the issue will be sent upon request

Halsey, Stuart & Co.
Incorporated

The Minnesota Loan and Trust Company
Minneapolis

First Trust and Savings Bank **Illinois Merchants Trust Company**

Brown Brothers & Co. **Bond & Goodwin**
Incorporated

Continental and Commercial Trust and Savings Bank

These bonds are offered for delivery when, as and if issued and accepted by us and subject to approval of counsel. Temporary bonds or interim receipts of Halsey, Stuart & Co., Inc., later exchangeable for definitive bonds will be ready for delivery on or about May 25, 1925. All statements herein are official or are based on information which we regard as reliable and while we do not guarantee them, we ourselves have relied upon them in the purchase of this security.

Chicago, May 8, 1925

News Briefs from Washington

Publishers Want Newsprint Definition Established on Basis of Use

The hearing before the customs experts in regard to altering the definition of newsprint was postponed from April 17 to May 5. The hearing was held on the latter date and the representatives of the American Newspaper Publishers' Association presented their attitude toward the proposed definition.

That any paper which a newspaper my wish to use, even book paper such as that used in the Saturday Evening Post, should come in free of duty, if consigned to newspapers, and pay a duty if imported for any other purpose, was their contention before Judge McKenzie Moss, Assistant Secretary of the Treasury. S. E. Thomason, of the Chicago Tribune interests, president of the American Newspaper Publishers' Association, was the spokesman for the publishers. He added that the newspapers should be allowed to take advantage of developments in paper making to bring in any new type of paper which might be produced, suitable for newspaper use, referring specifically to the rumors that a Canadian company proposes to make a newsprint paper from bleached sulphate pulp. He also contended that if in the development of newspaper publication, the newspapers used any paper not now used as newsprint, this paper should also be classified as such.

To this Henry A. Wise, who with C. G. Parker, represented the Import Committee of the American Paper Industry, retorted:

"I can not conceive that Congress in framing the tariff act of 1922 designed the free list of that act to protect the infant industries of Canada."

At the outset of the hearing, Mr. Wise, stating that the Import Committee had outlined its position at the previous hearing, said the present hearing was at the desire of the publishers to be further heard, Mr. Thomason then told of conferences held between the Import Committee and representatives of the publishers. He offered, as the publishers' suggestion, a definition providing that any paper going to newspaper publishers should be classified as standard newsprint paper, and that any paper not going to newspapers be held dutiable. He pointed out that newspaper development has trended toward pictorial sections, and that this would require a different type of paper from that used when the tariff act placed standard newsprint upon the free list.

As a final argument he suggested that the present definition be allowed to stand still until the publishers could persuade congress to change the tariff law to give the publishers what they wish.

Judge Moss indicated the doubtful legality of any definition such as Mr. Thomason requested which would permit paper going to newspaper publishers to be imported free of duty in one case, and when going to other users to be required to pay a duty. Mr. Wise for the Import Committee added that this was a matter of such doubt that the definition should include specific description of what constituted standard newsprint paper.

Mr. Wise devoted his argument to the intent of Congress to protect the newspaper publishers with free paper, but also to protect the domestic manufacturers of other grades of paper. He pointed out that Mr. Thomason's wish to have free any paper, even high grade book paper, free of duty, if used by newspapers, would overturn the entire balance of the tariff act as applied to all other papers, and was therefore unthinkable.

Mr. Wise said that the definition supported by the Import Committee was one which would not affect any American newspaper using any ordinary grade of paper; that it was farthest from the thought of the Import Committee to place any undue restriction upon the newspaper publishers, that the Committee did wish but to prevent the improper entry of paper which is not standard newsprint, under the duty free provision of the tariff act.

Representatives of the importers then had their innings, protesting particularly to the references made to "bootlegging" of paper. They took issue with the publishers on the proposal to establish the definition on the basis of use.

Judge Moss cut short this general type of discussion by asking Mr. Parker to state the facts as developed by the Import Committee, bearing upon the specific tests embodied in the proposed definition. Mr. Parker featured in his statement the fact that the definition was not built up as a theoretical set of tests, but had been made after a compilation, with reasonable tolerances, of tests of paper actually used by newspapers in all parts of the country. The definition, therefore, should be satisfactory to the publishers, and to all except those who wished to use a too broad definition to secure the improper entry of other classes of paper. Asked to specify instances of paper bootlegging, he said that he could mention cases of paper for ink tablets, stenographers' notebooks, sized to permit use of ink, halftone paper, and the like, in which the importers attempted to bring in these papers as standard newsprint paper. The admission of supercalendered paper as standard newsprint was not justified by the fact that only one paper in America today uses such paper and no newspaper used it in 1922.

A brief was presented from the National Paper Trade Association on behalf of the importers, but this was chiefly devoted to correcting the omission of sheet news in the definition, an omission the correction of which had already been suggested by the Import Committee.

Foreign Markets for American Paper

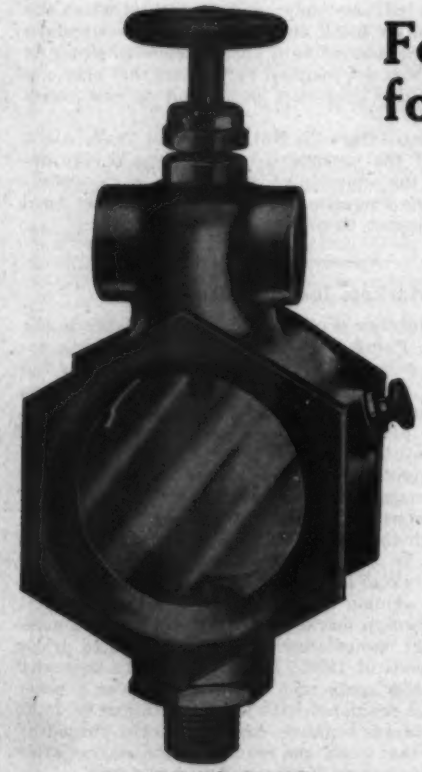
The editorial on foreign paper competition published in the April number of the PAPER INDUSTRY has met with strong approval in the Department of Commerce, especially in the paper division. Mr. O. M. Butler, chief of the division, gave us an abstract of the Department's feeling on the subject, and later, on April 27 printed a more complete article in the "Commerce Reports of the Department."

"The lack of interest in foreign markets," said Mr. Butler, "is not easy to understand when considered on a strictly commercial basis. The usual plea that the American products cannot compete with the low prices of foreign markets is not entirely accurate. An average of two million dollars worth of American paper is sold abroad by American manufacturers every month. The opinion of many United States manufacturers concerning foreign markets was formed during the depression of 1921 that immediately followed the inflated prices and abnormal demands of 1920. In addition to the necessity of reducing production costs and domestic prices to a point that seemed ruinous compared with those prevailing in 1920, American manufacturers began to be underquoted abroad by the European mills that were then reentering the market after a period of inactivity caused by the war.

"In fact, the European prices made in 1921 were chiefly guesswork, depending on wages that were also guesswork. When considered on the pre-war price level they were only about one-third of their apparent value. Except in a very few countries, European prices were very much lower than actual conditions warranted—and they have been going up ever since as a result of the constantly recurring strikes that have been taking place ever since.

"Paper production costs in the United States went up with other costs and were increased by the exchange rates. Nevertheless, shipments at peak prices held until the end of 1920. European manufacturers, including laborers and supplies of pulp wood and other raw material, set out by considering values in the light of pre-war prices. This was a false understanding of conditions and could not endure. In spite of

Mesta Reduction Gear installation R-P lubricated--in International Nickel Company plant.



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Forced feed automatic lubrication for reduction gears and pinions

Continuous streams of cool, clean, filtered oil are delivered by Bowser's systems to gears, pinions, and bearings. Life of the gears is lengthened. Troubles due to overheating are avoided, forced shut-downs are eliminated, and production is maintained.

Our Lubrication Engineers have had much experience. What they know is at your service.

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S.F. BOWSER & COMPANY, Inc.
LUBRICATION ENGINEERS AND MANUFACTURERS
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LUBRICATORS · OIL FILTERS · OILING SYSTEMS · ACCESSORIES
OIL STORAGE AND DISTRIBUTION SYSTEMS

fluctuations the trend of prices has been upward and will continue to be until true values are reached."

German Costs Advance.—The paper industry of Germany may be regarded as an example of the adjustment that has been and still is taking place abroad. During 1921, with little demand at home, a depreciated exchange, low production costs, and the need of ready money, German offers in foreign markets were often in the nature of forced sales, and quotations were in many instances considerably under production costs in the United States. There was, however, no regularity in the prices quoted which varied with the immediate situation and necessities of each mill and all branches of the industry in Germany complained that operations were carried on at a loss.

The last months of 1921 and the year 1922 saw substantial increases in all the more important items that enter into the cost of production. A coal shortage was accompanied by a lack of pulp wood which it became necessary to import from Czechoslovakia and Finland at constantly increasing prices. At the same time, workmen demanded higher wages and somewhat later general freight rates were increased 100 per cent to meet the railway deficit.

These advances continued during 1923 and by June of that year newsprint prices were more than 60 per cent greater than those quoted at the end of 1922. As production costs approached world levels, advances became more gradual but continued. On August 1, 1923, No. 1a unbleached sulphite was quoted in Germany at $2.82 a hundred pounds. This price with some fluctuations had advanced to $3 by December, 1924, and to $3.05 by February, 1925.

During the earlier years of this period, the depreciation of the mark and unsatisfactory industrial conditions generally throughout Germany limited domestic demand and forced the making of unprofitable sales abroad. A substantial improvement in domestic demand occurred, however, during 1924 and, despite an increase in production of approximately 16 per cent, compared with 1923, exports decreased by slightly less than 50,000 tons. As Germany is not yet consuming its pre-war quotas and reports continue to be received that high wages, freight rates, and prices of raw materials are forcing production costs to a point where it is increasingly difficult to compete abroad, there is reason to believe that still greater proportions of the German output will be absorbed locally.

As in Germany so also in other European countries. Norway and Sweden have been subjected to increasing demands by labor, which led to further strikes and lockouts. The latest was ended on March 28 with an increase in wages, which of course must bring about higher prices. Further demands by labor are expected.

Austria and Czechoslovakia have been running on very narrow profits where they did not run at actual losses. Prices in the latter country took an upward trend during 1924; and during the opening months of 1925 were 10 per cent above the Hamburg market. And so on.

This shows that estimates of possibilities of American competition founded on recent prices are not well founded. The latest changes puts American products on a competitive basis and brings others nearer to it. The manufacturer who does not keep watch on these changes is likely to overlook markets that are well worth while.

The French Paper Industry.—Consul Raymond Davis, reports from Paris that the French production of paper of all sorts is estimated at 700,000 metric tons a year, divided as follows: Cardboard, between 250,000 and 300,000 tons; cigarette paper, 20,000 to 25,000 tons; and newsprint, 75,000 to 90,000 tons.

The newsprint estimate is based on an annual production of 90,000 tons before the war. But many manufacturers are devoting their attention to other grades and the production is probably really between 60,000 and 75,000 tons. Paris journals use almost exclusively imported newsprint in rolls and provincial journals domestic output in sheets ready for printing.

French paper and paper products requirements are about 794,000 tons annually. The French industry depends largely on imports of raw materials; only about one-third of the newsprint needed is produced in France.

Imports of newsprint and a number of other papers fall under the classification "plain, machine-made paper of more than 30 grams weight per square meter," which items represents approximately 90 per cent of the total paper and board imports. Allowance being made for kraft and other wrapping papers, receipts of newsprint during 1924 are estimated at 118,000 metric tons, or 80 per cent of this item.

The paper industry is largely dependent upon foreign sources for its supplies of wood pulp—a condition which is a cause of increasing concern in view of the decline in imports of this kind and greatly augmented imports of finished paper and board. The French forests supply the mills with some spruce and soft woods, but the output of the 30 pulp mills, which are run largely as annexes to the paper mills, is only 100,000 metric tons per year, while imports of wood pulp during the past three years have averaged 386,000 tons.

Sweden, Norway and Finland supply about 75 per cent of the imports. Germany and Austria supply large amounts of chemical pulp. Canada was once expected to liberate France from dependence for wood pulp on former enemy countries, but unfavorable exchange, together with the fact that Canadian mechanical pulp was found to be too heavy for the French market and called for a considerable admixture of Scandinavian pulp when used in the manufacture of newsprint, has caused a sharp reduction in imports from that source during recent years.

The commerce in waste papers, rags, and other paper-making waste, ordinarily included under the general term "drills," is an item of considerable importance among the raw materials on the market in France. In 1924, imports of this class of material were 100,853 metric tons, compared with exports amounting to 101,660 metric tons. The imports, however, consisted mainly of old papers from England, while exports were chiefly rags, other than woolen, to the United States and Belgium-Luxemburg.

American manufacturers now supply 25 per cent of the total French imports of paper board.

Wages and Hours of Labor in the Paper Industry

The Department of Labor, through the Bureau of Labor Statistics, has just issued Bulletin 365, on wages and hours of labor in the paper and pulp industry in 1923. Summary figures of this Bulletin were published in the Monthly Labor Review for March, 1924.

Data were secured from 199 establishments located in 16 States, and include 35,799 male and 3,262 female, wage earners. Of these, 13,011 were employed in pulp mills, and 26,050 in paper mills. The figures relating to pulp mill employees were limited to mills making pulp by the ground-wood, sulphite, or sulphate, processes. The data for paper include mills making book-paper, newsprint, wrapping-paper and writing-paper.

The average earnings per hour in the pulp mills ranged from 27.3 cents in Louisiana to 49.1 cents in Michigan and Ohio. The average hourly earnings in the paper mills ranged from 42.6 cents in the writing-paper mills in Wisconsin to 65.9 cents in the book-paper mills in New York.

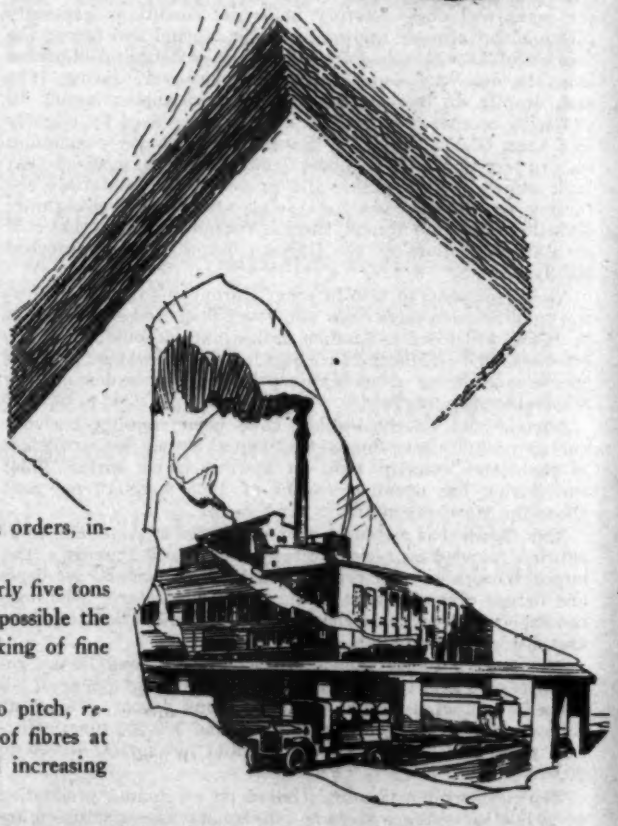
The average full-time hours per week in the pulp mills ranged from 50.3 in New England to 67.3 in Louisiana; and in the paper mills they ranged from 48.1 in the newsprint mills in New England to 59.5 in the wrapping-paper mills in Pennsylvania, Maryland and Virginia.

In addition to tables showing in detail, for each branch of the industry, the average hours per week, earnings per hour, and earnings per pay period of employees by occupation, sex, length of pay period, and region, the report contains a brief history of the industry, a description of operations and equipment, a glossary of occupations, and general information relating to changes in wage rates, overtime pay, bonuses, etc.

Fred D. Howland, president of the Thomas Phillips Paper Co., of Akron, Ohio, died at his family home in Hudson Falls last week. He was 59 years old and was a son of the late Amasa Howland, the founder of the paper industry in Washington county, N. Y. A grandfather, Stephen Howland, built the old paper mill at Baker's Falls, the first of its kind in New York state. In 1899 the Howland Paper Company sold out to the Union Bag and Paper Corporation which still conducts the paper business in Hudson Falls.

The New Beloit Shake

Produces a better formed sheet at a higher speed.



The new "Beloit" Fourdrinier and Shake has been designed, perfected and patented for the purpose of producing a better formed sheet at a higher speed, to accomplish on a wide, high-speed machine what a narrow, slow-running machine has heretofore done. Its application in tissue, kraft and other paper mills shows that it is accomplishing this with ease. It has demonstrated money, time and labor-saving qualities that have opened the eyes of mill men the country over.

Its application in one mill alone showed an increase of 15% in production within a few days after its installation. Sixteen orders, including four re-orders prove that it is "delivering the goods."

On a 160-inch wire, 75 feet long, the "Beloit" Shake has nearly five tons less to vibrate than on the old type of machines. This makes possible the "jolt" so necessary in properly interlacing the fibres in the making of fine papers.

The New "Beloit," with its three features: *adjustable* as to pitch, *removable*, for changing wires and *shakeable* for the interlacing of fibres at increased speeds, is solving the problem of lowering costs and increasing production by superior *efficiency*.

Send for Bulletin No. 9 for further facts.

Beloit Iron Works **Beloit, Wis., U.S.A.**

ESTABLISHED SINCE 1858

The Pacific Northwest for Paper Making

By B. T. McBAIN

HAVING set forth in a number of articles the great advantages of the Pacific Northwest as the paper making center of the United States in the early future, it is necessary that I do not allow to pass by unnoticed Mr. Edward B. Fritz's article on the South in the January number of his valuable paper magazine, THE PAPER INDUSTRY, in which, in effect, he stated the West was all right for the West, but too far away from the East where the main markets of this country are found. Of course, he stated further that for export in addition to the Pacific Coast markets, the Pacific Northwest would come into its own.

The South is in a class by itself for certain grades of paper, but the South will never be a big factor in the paper markets of North America, in my opinion, and I will give some of my reasons therefor.

Today, if paper 1241 issued by the United States Department of Agriculture has a value for statistical purposes, America uses over eight million tons annually.

On page 28 of this publication it is estimated on the basis of the actual consumption of former years that America will use in 1925 around 8,250,000 tons. Of this total over 30 per cent is newspaper, about 12½ per cent book, about 25 per cent boards, probably 12½ per cent wrapping and the balance fine papers and other grades. While 25 per cent of this total is board, only about 20 per cent of board is made from new pulp, so only 5 per cent of the total consumption of the country comes from new pulp.

Newsprint is our greatest tonnage consumed. Already 50 per cent of this consumption is made outside of our national borders, but the South cannot be depended upon for the manufacture of newsprint at least until new methods have been found for the pulping of southern woods.

The forests of New England and Lake States cannot be depended upon for a much longer period to supply pulp wood for the manufacture of the present tonnage of newsprint paper.

Canada is not in as enviable a position either for the furnishing of pulp wood to American mills as some would try to make us believe, and right now efforts are being made—and strenuous efforts at that—to place an embargo on Canadian pulp woods.

Right now wood and pulp for nearly 50 per cent of the papers made from new pulps are being imported and the greater portion of this comes from Canada.

The Pacific Northwest States and Alaska have not a perpetual supply. It will only be a few short generations when the pulp wood of America's original forests will be extinct unless more than talk is done to prevent the present waste in logging, the great waste from fires and the other wastes in every wood converting industry.

But, while the South will be a factor in the manufacture of wrapping paper, though not now making more than a possible 5 to 10 per cent of the total consumed, the South cannot produce or be expected to be the factor in the pulp and paper industry of America that the Pacific Northwest must be.

True the Pacific Northwest is a long way from the great American paper consuming markets, but it is not so far as Sweden and Norway from which many hundreds of thousands of tons of pulp and paper are now being imported into our good old United States, and it has even better transportation possibilities than have these foreign countries, for the Pacific Northwest can reach all ports of America by rail as well as by water and rail, and at the present time water rates from Pacific Coast mills to Southern and Atlantic States ports make it possible not only for these mills to compete but to show a good profit on the business as against possible loss on the part of eastern mills delivering at the same prices to the same ports.

Pacific Northwest mills already built are not the only possible ones for present and future consumption. There are better sites available today than have yet been developed, since today electricity is in a very much more highly developed stage than when present mills were built.

Pacific Northwest mills, with fuel oil at low cost, hog fuel at low costs, pulp wood at lower figures than seem reasonable and electric power at rates making it unprofitable to develop one's own water power, will not only compete in the East but will, within ten years, be the greatest factor in American newsprint manufacture as well as in the manufacture of other high grade papers requiring new pulps, even including the manufacture of kraft papers for which the Southern states are now becoming famous.

Very little No. 1 kraft paper is coming out of the South. True, as they become used to the woods and fibre they are using, they will find a way of producing No. 1 point for pound test paper as well as the present high tear and folding test papers they are now producing. But the Southern states will never be able to take anywhere near the place in American pulp and paper production that the Pacific Northwest states must soon take if America is going to continue to manufacture anywhere near the amount of paper she now consumes.

Even today for the twelve million people of the nine Western states, Washington, Oregon, California, Arizona, Nevada, Idaho, Utah, Montana, Colorado and Texas, not over one-half to two-thirds of the paper consumed is being manufactured in those states and even the rail freight rates from the present mills, in most instances, give the present mills an advantage as against Middle Western plants.

The Southern mills will get some of this surplus now coming from the lake states mills, but as the wood supplies of these last mentioned states are exhausted, all must look farther west, out to where the West begins for their paper supply.

I am sending this not in the nature of fault finding, not in the nature of correction, but in the light of information which the author did not have when he wrote his interesting and instructive history of paper making in the southern states.

Pacific Coast News

May 1, 1925.

Pacific Straw Paper and Board Co. Ready to Operate

The Pacific Straw Paper and Board Co., with its modern $250,000.00 plant nearing completion, expects to begin operations this month. This plant is located near the city of Longview, Wash., on a 15-acre tract on the Cowlitz river waterfront, and the first unit covers about five acres. The additional area has been provided for future growth and according to C. F. Schuab, president of the company, plans are completed for the doubling of the capacity within a year's time, and for the addition of a straw paper box factory shortly after the beginning of operations of the first unit.

The first unit of the plant will have a capacity of 30 tons finished product per day, working three eight-hour shifts, and employing about sixty men, twenty for each shift.

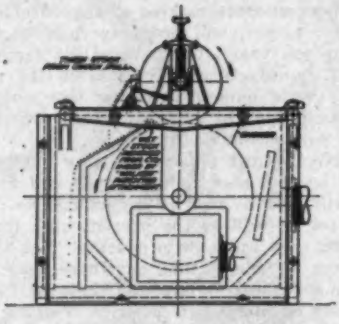
Raw material for the product is wheat, straw and lime. The company owns its own lime deposits in Klickitat County. Within a radius of forty miles of Longview, according to Mr. Schuab, offerings of wheat straw by farmers has amounted to 6,000 tons annually. A still greater abundance of straw is obtainable up both the Columbia and Willamette River valleys. Requirements for the first unit of strawboard factory will approximate 10,000 tons annually.

The plant is equipped to handle straw, waste paper, or wood pulp. Conditions of manufacture require that the machinery be broken in with paper pulp, and it is expected that after the first three months, straw will be used almost extensively, at at least in the first unit.

Buildings of the factory are of reinforced concrete construction, with the floors four and a half feet from the ground level. Curtain walls are of hollow tile, and the entire plant is windowed and ventilated.

A spur track connects with the Longview, Portland and Northern Railway, and provides adequate railway transportation. The company has a temporary dock to the Cowlitz river and a permanent dock, 60 feet long, is to be built along the river for the unloading of raw material. The finished product will largely be handled by the railway, and shipment from the first unit will amount to at least a car a day.

Hog fuel, from the plant of the Long-Bell Lumber Co., will



Standard Deckers with Walker Attachment

(Patent Applied For)

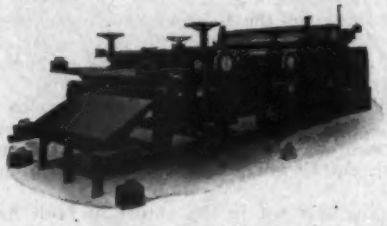
Our Deckers equipped with the Walker Attachment as shown in cut will increase your capacity 50% without requiring additional floor space, power and maintenance.

One firm has ten machines so equipped, which saved the expense of building a new Decker room.

Improvements in couch roll housings offer ready means for regulating consistency of stock.

It is a big advance in Decker design.

Write us today for further particulars.



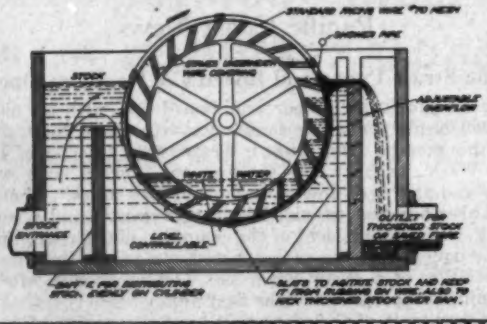
Rogers and Special Wet Machines

IMPROVED AND SIMPLIFIED
SINGLE AND DOUBLE PRESS
FOR CONVERTING CHEMICAL PULP INTO SHEETS 48% DRY

25-35 TONS air-dry pulp per 24 hours. Built in 72" width, with patented pulp weakening and separating device or our new automatic knife cut-off attachment. A real labor saver.

FREIGHT CHARGES are greatly reduced. Savings on this item alone often pay for the machine in one year.

All infringements will be vigorously prosecuted



A. D. Wood Machine

Used as Pulp Thickeners, Savealls, Pulp Washers and Water Filters

ADVANTAGES:

Reduced Wire Costs	No Couch Roll
Enormous Capacity	Minimum Repairs
Only 2 H. P. Required	No Doctor
Works Automatically	Requires No Attention

OVER 150 MACHINES SOLD AND IN USE

Wells Undulating Knot and Sliver Screen

Will bear closest investigation from every angle. It separates knots and slivers from all kinds of pulp efficiently, continuously, automatically with negligible cost for operation and upkeep. Simple but rigid construction. Only best materials used. Operation in plain view.

40 TONS DAILY CAPACITY, STANDARD SIZE. WRITE FOR BLUEPRINT AND FURTHER INFORMATION

PULP AND PAPER MILL MACHINERY
GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

OUR LINE IS MANUFACTURED IN CANADA BY

THE NORTHERN FOUNDRY & MACHINE CO., LTD., SAULT STE. MARIE, ONT.

be used as fuel for two 150 H. P. boilers, which will furnish steam for cooking the straw and for the battery of drying cylinders. All of the machinery of the plant will be electrically driven with power furnished over a high tension line from the power plant of the Long-Bell Lumber Co. mills a mile away. The power line is already in place. Fifteen Fairbanks-Morse electric motors, varying in size from 4 to 150 H. P., will be used.

The process of manufacture, together with a description of the various buildings of the plant, has been outlined by Richard Clayton, manager of the Pacific Straw Paper and Board Co., as follows:

The raw materials, baled straw and lime, will be received on the dock and carried over an inclined platform to the second story of the rotary house or cooking room, 40x80 feet. On the ground floor are six cookers of 5-ton capacity each, where the mixed straw and lime are cooked under 40 pounds steam pressure for eight hours.

The material next goes to a stock pit 40 by 40 feet square, which has a storage capacity of 200 tons, and is then taken to the beater room, 40 by 120 feet in size, and distributed to the six beaters. The beaters are of 1,500 pound capacity.

The beater chests are each 12 feet in diameter and 14 feet deep, constructed of concrete and tile.

The five-cylinder machine has forty dryers, 81 inches in width, and two stacks, the first stack having five rolls and the second stack seven rolls.

The finished product for shipping is either in rolls, weighing 50 to 600 pounds, or in 50-pound sheet bundles.

The railroad siding which parallels the entire length of the machine room makes loading the cars convenient.

The paper machine room is the largest single room of the first unit, and is 40 feet wide and 188 feet long.

The plant will have its own independent water supply, and fire protection will be provided by a sprinkler system covering all the buildings.

The Pacific Straw Paper and Board Co. is capitalized at $500,000.00. Officers are C. F. Schuab, president; George A. Sweet, secretary-treasurer, and Richard Clayton, manager.

When in operation the plant will run continuously six days a week. Arrangements have been made for department heads to come from the middle West, and C. R. Crawford, of Middletown, Ohio, where the machinery for the mill was made, will be the master mechanic; H. Leonard, of Dayton, Ohio, will be the assistant manager, and each will bring with him his own foremen.

One of the primary considerations that caused the Pacific Straw Paper and Board Co. to locate in Longview, according to C. F. Schuab, president, was the advantageous freight and water rates in comparison with those of eastern mills. The Longview factory is the second plant of its kind to be established in the Northwest, and as its competition will be almost wholly with eastern mills, it is felt that the cheaper freight rates to the Pacific Coast cities is a tremendous advantage.

New Mill Being Projected

Announcement of the organization of the Grays Harbor Pulp and Paper Co., capitalized at $1,500,000.00, and immediate construction of a large paper mill on a site on the Wynooche river, near Montesano, was made on April 15th by Mr. D. P. Boles of Seattle, representative of the interests that will construct the plant, and W. E. Johnson, secretary of the Aberdeen Chamber of Commerce, who has been chiefly instrumental in locating the plant in the Grays Harbor district.

Construction of the mill will be under way within thirty days and operations are expected to begin by January 1, 1926.

Work of clearing the site, the location of which will be kept secret for the time being, several points being under consideration, and shipment of the building material and machinery will be started at once, it is said. The mill will employ about 100 operatives at the outset and this number will be increased to 300 to 400 when the plant is fully developed.

The whole details of the plan were laid before the executive committee of the Chamber of Commerce and received enthusiastic support. The plan provides that $250,000.00 of the capital stock will be released for subscription and most of this has been subscribed.

The mill will be a specialty mill, manufacturing all grades of tissue paper and groundwood pulp. It will use all grades of Grays Harbor woods except fir, and in particular will use large quantities of hemlock, alder, cottonwood and tideland spruce.

New Mill for Kalama, Wash.

It is stated on good authority that the new tissue mill of the Leadbetter Lumber and Paper Co., which was to have been built at Camas, Wash., before the sale to the Crown Willamette Paper Co. of its holdings there will be built at Kalama, Washington, where Mr. F. W. Leadbetter, president, and Mr. B. T. McBain, vice-president, have secured valuable rights both for power and manufacturing purposes.

Plans are being made and estimates for the buildings and machinery are being made at this time for such a plant.

In addition to the tissue mill, it is stated a 100-ton newsprint mill is also being arranged for.

"Kalama has three competing railroads—is on deep water on the Columbia river—has pure mountain water for manufacturing and in many other ways is a natural location for a pulp and paper mill, but I am not saying now that the Leadbetter Lumber and Paper Co. will build a mill there. In fact, I prefer not to be quoted at this time," said B. T. McBain when questioned by a paper mill correspondent.

Lewis River Co. Clearing Site

Work is progressing on the clearing of the site, and surveying and engineering crews are at work on the new development known as the Lewis Pulp and Paper Co., which will be built at Alderwood, Wash., three miles south of Kalama, on the Columbia river, with the main lines of the Northern Pacific, Great Northern and Union Pacific within 300 feet of the mill site, and with the Pacific Highway but a third of a mile distant.

The site is within easy reach of an abundant supply of cottonwood, hemlock and alder, and adjacent to large stands of other suitable timber. The location is highly advantageous from a transportation standpoint. Company officials state that a more than adequate market is immediately available.

The cost of the plant is announced at $354,195, with an anticipated output of 3,500 tons of tissue and lightweight wrappings and 4,500 tons of wood pulp.

The company is capitalized at $700,000.00.

The Cascade Paper Co., of Tacoma, has increased its capital stock from $850,000 to $1,750,000.

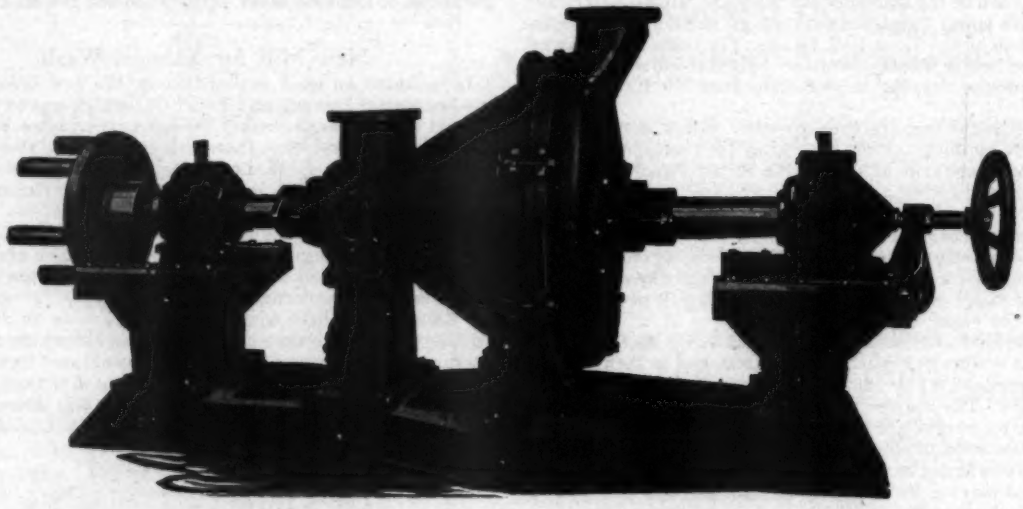
The British Empire Exhibition of 1925

It does not appear that the collective exhibit of the combined paper manufacturers and paper machinery builders will be on show at the "New Wembley," but a strong display by the printing and allied industries will again be one of the attractions of the southwest corner of the Palace of Industry. In it will be included exhibits by typical printing, stationery, map-making and publishing firms. Canada has announced that its display will be 100 per cent better than it was last year. It is going in very strongly for scenic effects, chief among which will be a diorama three times the width of the stage of Drury Lane Theater (the largest theater stage in London). It is claimed that this will be the biggest thing of its kind ever produced in the world; it will have movement throughout and over 2,000 lights will be used to illuminate it. In addition to this big diorama, there will be twelve smaller ones, each representing a different phase of Canada's life and activity. Newfoundland, which had a big display of paper products last year, was the first colony to express its desire to continue its exhibit in 1925.

Dean Moon on Journal of Forestry

Dean Franklin Moon, New York State College of Forestry, Syracuse University, has recently been appointed a member of the editorial staff of the Journal of Forestry.

The Journal of Forestry is the official organ of the Society of American Foresters and is the medium through which a large majority of the technical papers written by the leading foresters in the United States appear.



THE NEW CLAFLIN WILL SAVE YOU MONEY

IN DESIGNING the new Claflin Refiners, the basic idea was to produce a refiner which would fulfill every beating requirement, withstand the hardest use and abuse and deliver the greatest percentage of properly beaten stock to the paper machine. To say that this objective has been reached is better proven by the fact that many users say the Claflin does better beating, brushing and refining; uses less floor space and power than similar types of Refiners. In fact "Claflins can't be beat for stuff that is hard to beat."

Ball Bearings Throughout

A complete unit will handle the most difficult stock direct from the cooker and prepare it for the paper machine without any necessity of regular beating machines. The pulp will be stronger, finer and more uniform. True, the initial cost of the Full Ball Bearing Type Claflin is a trifle more than the old style, but the saving in horsepower consumed soon overbalances that margin. No stock is too difficult for the Claflin to handle.

The Claflin makes a continuous beating operation possible, a fact which has many distinct advantages. It is now a proven fact that the Claflin cannot be excelled for Rope Manilla, Leather Board, Sulphite Screenings, Wall Board, Kraft Paper and waste from Pulp Stones. When used on Sulphite Screenings, the waste pile is smaller and the profits bigger.

Write for catalogue. Built in three sizes

HERMANN MANUFACTURING CO. **Lancaster, Ohio**

THE WATEROUS ENGINE WORKS COMPANY, Ltd.
Brantford, Canada
Licensed Manufacturers

Michigan News

May 1, 1925

Superintendent's Meeting Held

On Thursday evening, April 23, the Michigan Division of the American Pulp and Paper Mill Superintendent's Association held their monthly meeting. The speaker for the occasion was Prof. L. J. Young, of the Department of Forestry of the University of Michigan. He gave an interesting talk on "Conservation." The keynote of his address was our rapidly diminishing forests in which he said that the time is not far distant when all of our forest products will have to be imported from Canada. He cited Germany and Sweden's reforestry system, and explained how we could do the same and become self-sufficient in our forestry products.

Mr. Alden, of Bauer Brothers Co., Springfield, O., gave a short talk on their new pulping machine, followed by a general round table discussion.

Those present were: E. H. Gilman and Alfred Bryant, Bryant Paper Co.; L. J. Young, University of Michigan; Micheal Redmond, Kalamazoo Paper Co.; Wm. Sievert, Michigan Carton Co.; John Spoor and Geo. Pountain, Allied Mills; Mr. Alden, Bauer Brothers Machine Co., Springfield, O.; Clarence Thorne and Fred Scheid, Watervliet Paper Co.; L. M. Mongreig, United States Rubber Co.; Jacob Parent, Western Board and Paper Co.; Vic Troyer, Constaintine Board & Paper Co.; James Wright, Wm. Cable Sons, and Clarence Harter, Rex Paper Co.

J. Linsey Crossley in Kalamazoo

J. Linsey Crossley, Chemical Engineer, has been in Kalamazoo for the last three weeks in the interest of the pulp and papermaking school. The Institute of Industrial Arts, Gardenvale, Quebec. The course at this authorized school is an intensive study of paper manufacturing.

The Allied Paper Mills, Bryant Paper Company, and Hawthorne Paper Co. will pay the entire cost of the course for any of their employees who will complete it. The Kalamazoo Vegetable Parchment and the Kalamazoo Paper Co. will pay one half of the cost of the course to any of their employees who will complete it.

The cost of the course is one hundred and twenty-five dollars cash, or one hundred and forty five dollars in monthly installments. This is an eighteen months course. Classes will be organized, to meet twice a month, as soon as enrollment justifies such a movement. Olan Calahan, chemist at the Allied Mills, has been left in charge of this.

At present, the Allied Mills has twenty-one enrolled, the Bryant eighteen, and nine at the Hawthorne. These have all signed up, and each mill has about the same number coming in between June 1st and October 1st, making quite a sizable group for this district.

Holyoke Plant Will Move to Kalamazoo

Another industry, auxiliary to the manufacture of paper is to locate in Kalamazoo, and promises to be an important and interesting addition to this growing paper center.

Louis P. Simon, secretary and manager of the Bermingham and Prosser Paper Co. announces that his concern will engage in the manufacture of kindergarten papers in the future. These will be colored, from the brightest hues to the softest tints.

The new industry will be established in the north building of Fuller and Sons Manufacturing Co., North Pitcher street. Lease has been taken of the second floor of that structure, which is considered one of the finest factory structures in Michigan and splendidly adapted to turning out high grade paper products, where cleanliness and freedom from dust and smoke are important features.

The plant was previously operated in Holyoke, Mass., under the management of James H. Armstrong, an expert in his line and who comes to Kalamazoo to take charge of the industry here. He is expected to arrive in the immediate future.

Machinery, especially built for this type of manufacture, has been ordered, very little of the old machinery used at Holyoke being available for the business here. The process provides for the passage of the raw stock through a color vat, then over a set of dryers and is applicable equally to dull finishes or coated papers. It provides by scientific methods the use of accurate and correct colors, the range of shades numbering about 70. Aniline dyes of the highest grades are used in the manufacture of colors. There are also special machines for embossing papers. These papers, all grades, weights, and colors, will be prepared for shipment in sheets and rolls.

"We expect to be operating our new department in about 30 or 60 days," said Mr. Simon. "We were fortunate in closing a satisfactory lease for the Fuller building. That gives us 11,000 square feet of the finest factory floor space in the city. It is also very close to our general office, another convenience that will be appreciated. We do not intend to start on a big scale, using from 15 to 20 employees at the outset."

L. W. Sutherland Heads Paraffine Company

The Kalamazoo Paraffine Co., capital $25,000, has been organized and will start business in this city about June 1. The Pennsylvania Railroad warehouse, located at Fulfor and Reed streets, has been leased and will be used for factory purposes at the outset. This is a one-story frame structure, and contains approximately 500 square feet of floor space. Special machinery has been ordered and will be ready for installation in about two weeks.

Mr. Sutherland states: "The Kalamazoo Paraffine Co. was organized to refine petroleum products. We purchase what it known as crude scale, a low grade product and refine to a high grade under special patented methods, originated by Mr. Macumber. The refined article is sold to waxing paper concerns, and other industries that use wax in their process. We employ about 15 men at the outset."

The officers of the concern are: President, L. W. Sutherland; vice-president, W. A. Macumber; secretary and treasurer, F. W. Sutherland.

Gus Riedel Enlarges Plant

Gus Riedel, manufacturer of high grade, hand made, coating mill brushes, has completed a new factory on Winslow ave. The new factory will be ready for occupancy early in June.

The building is 166 by 60 feet over all, with a fireproof storage room for raw stock, 20 by 23. The construction is of the highest type, being of steel brick and glass, with a built-up composition roof. One of the most approved types of Perkins kilns has been installed, American Radiator boilers have been ordered and Clarage Fan Co.'s ventilating fan system will be used. All wood and metal working machinery will be electrically driven.

Gus Riedel, who learned his trade in Posen, Germany, specializes in the manufacture of high grade, hand made coating and textile mill brushes. He has been able to compete successfully with the cheaper made brushes of Europe and ships his products all over the world.

Bradford Mills in Operation

The plant of the Bradford Paper Co., in Fulford street, Kalamazoo, is now in operation, making coated paper for the market. One of the large coating machines is running steadily. The second one should start in a week or ten days, while the two others are being installed. C. A. Bradford, president of the company, reports that the plant starts with a good run of orders on hand.

Within the last 45 days, the work of disposing of stock and perfecting the organization has progressed rapidly. In accordance with a recent decision of the directors, the subscribed capital has been increased from $200,000 to $250,000, practically all of which is subscribed. President Bradford says the additional funds thus secured will give the concern $100,000 working capital and obviate the necessity of arranging bank loans.

Everret Hays has been engaged as superintendent. He is a well known papermaker, having been for five years with

French Lick Springs Hotel

and your next convention—

At this accessibly located, world famous resort in southern Indiana's Cumberland foothills, you can hold your next convention with the advance assurance that it will be the most successful one your organization has ever had. Yet, you are not asked to decide upon French Lick Springs without due consideration nor without point for point comparison with other locations. Investigation of the advantages afforded here will make you wonder why French Lick Springs as a convention place had escaped your attention heretofore.

You Transact Business More Quickly

Every participant in a French Lick Springs convention eats and sleeps and attends the official sessions under the same roof. There is no scattering around of delegates at various hotels. The one magnificent modern French Lick Springs hotel building comprises not only everything needed for the personal requirements of every convention visitor, but also a spacious, well lighted and ventilated special convention auditorium, in the newly completed large wing, with seating accommodations for 1,500. And, adjoining the main convention room there is a smaller hall seating 200, besides committee rooms, rest rooms and other facilities.

This means that everybody attends and participates in all the sessions and that each day's convention business is concluded speedily and efficiently—a welcome change from the annoying delays and absences that so often interfere with convention programs.

More Time Available for Amusement

Delegates may have to go far afield for diversion and amusement at other convention sites, but here, right on the hotel property, are two of America's best known 18-hole golf courses; one, the comparatively easy, older course, practically at the hotel doorstep; and the other, that celebrated championship Upper Course where Walter Hagen won last year's professional title, just a short motor bus ride away. Special tournaments, open only to convention participants, can be arranged.

Here are two well-kept tennis courts—and miles of attractive woodland trails for tramping or horse-back riding, while one of the best stables of thoroughbred saddle horses in America is maintained on the hotel grounds.

The bath department comprises, besides every approved therapeutic bath treatment, an inviting swimming pool; and there is also a separate bath department, with pool, for ladies.

Write Now for Complete Information

Regardless of how soon or how far in the future your convention will be held, you will find it of advantage to know exactly what kind of service French Lick Springs Hotel offers you. Do yourself and your organization the justice of writing us now, giving us as much information as possible about the time of your convention and the number to be accommodated. Rooms and meals are included in the rate you pay here which means that expenses can be determined, almost to the dollar, in advance.

ADDRESS CONVENTION SECRETARY

FRENCH LICK SPRINGS HOTEL CO., French Lick, Indiana

"The Home of Pluto Water"

the Rex Paper Co. in the coating department and previous to that with the King Paper Co.

Landscaping the Rex Paper Company's Grounds

Making an efficient mill attractive is the improvement program that has been inaugurated at the Rex Paper Co. by Merrill B. King, president. The land just east of the office structure is to be landscaped with a large grass plot and plantings of shrubs and roses. Included in this work will be the improvement of the property along the right of way of the Michigan Central railroad.

At the suggestion of William LaCrone, superintendent of Riverside cemetery, Mr. King is having a water lily pond installed in the center of the landscaped space. This will be fed by running water and covered by a pergola. These grounds, when improvements are completed will be thrown open for the use of employees of the company.

Since July 1, 1924, the Rex Paper Company has expended approximately $70,000 in betterments. Included are items covering the erection of a new office building, additional equipment and machinery and extension of side trackage.

Kalbfleisch Corporation Running Full

The Kalamazoo branch of the Kalbfleisch Corporation is busy according to Reynolds Verdon, manager of the plant. Beginning operations about eight months ago, the local plant is now shipping each day about two carloads of finished products. Satin white and rosin size are the commodities made there, the territory covered being particularly the Kalamazoo Valley paper mills, also the balance of Michigan and other states in the Great Lakes territory.

"We are employing thirty hands now," said Mr. Verdon, "and are forced to operate at full capacity. Business is particularly good in the Kalamazoo valley, all the mills in this section having a fine run of business. Though operating only a little over six months, we are already cramped for room. As we own seven acres of land, it will be easy for us to expand when necessary."

Concrete Pouring at Kalamazoo Paper Company's New Mill

A remarkable piece of structural engineering work is being done in the erection of the new stock house for the Kalamazoo Paper Co. at mill No. 3. Built on muck land, it has been necessary to take the greatest precaution to secure a solid foundation for the immense structure. Getting down to a solid gravel bed required the sinking of 578 concrete piles, varying in length from 13 to 32 feet. On these piles were erected 105 piers, each five feet square and as thick, supporting a like number of huge pillars, both piers andl pillars being of the heaviest type of reinforced concrete construction. The hardest problems have now been overcome and the work of erecting the five floors is proceeding nicely.

The work on the enlargement of the power house, a two-story structure is also progressing rapidly. The lower floor will be used for extension of the pumping system. A Carey centrifugal boiler pump has been installed but is not yet connected. On the second floor will be a 2,500 K. W. General Electric turbine, reinforcing two 500 K. W. turbines now installed. The foundation for the largest unit is now going in.

While the 168-inch Fourdrinier machine for mill No. 3 will not arrive before July 1, an immense amount of auxiliary equipment is on hand and will be installed as rapidly as possible. Three Norwood Engineering Company's rotaries and a like number of storage vats are in place, while in the filtration room are also six largest type Norwood filters, ready for piping.

Michael Redmond, general superintendent reports that these installations will be made as rapidly as possible, the desire being to have the enlarged mill in operation by January 1, 1926.

Mr. Fred M. Hodge, president and general manager of the company, who has been enjoying a Mediterranean cruise for about three months in company with Mrs. Hodge, will return just in time to get in on the big expansion program now going ahead at his plant.

New England News

May 1, 1925.

Combating Small Order Evil

Small orders are becoming such a problem to the New England merchant and manufacturer that the Associated Industries of Massachusetts has appointed a committee of three men to formulate ways and means of combating this growing evil. The need for carrying larger quantities of paper on hand of many different lines ties up more capital than ever in both the manufacture and merchandising of commodities in New England. That the paper industry finds it a particularly important problem can be gathered from the fact that of the committee appointed by the Associated Industries, two of the three are paper men: Col. B. A. Franklin, vice-president of the Strathmore Paper Co., and J. M. Towne of the National Blank Book Co., of Holyoke, one of the largest paper converters in the country. The third member is H. W. Morrill of the Ludlow Jute Co.

This organized movement will be welcomed by the paper mills fully as much if not more than by any other industry in the section. For the problem to be met is one that has agitated the paper trade for over three years and at present grows worse rather than better. Where formerly supplies were purchased only once, twice or three times annually they are now bought monthly. The net result is an increased cost of manufacture and of shipment. Instead of paper mills keeping their machinery running for any length of time on any substantial orders, they have been compelled to constantly put into process small orders. This also necessitates frequent changes of sizes, styles and patterns. Less carloads, express, and parcel post service is called into play more frequently than the economic carload lot.

The first suggestions of the new committee are the placing in the hands of every member of the Associated Industries which includes the bulk of the fine paper manufacturers of the State a copy of "Elimination of Waste, What It Is and What It Offers." Every trade association to which members belong are to be made aware of this drive and asked to cooperate. Several articles are to be broadcasted among the members; and, lastly, the assistance of the Department of Commerce is to be requested with any special influence which they can bring.

Efforts to correct the trouble will not stop here. An intensive campaign to create sentiment among buyers as well as manfacturers for standardized products is to be undertaken. In the paper field, the question of standardization has already received considerable attention but there is room for a still further radical contraction in the number of brands and watermarked papers on the market.

Mills Increasing Storage Space

To act as reserves for their distributors, many paper manufacturers in New England are increasing the storage capacity of their mill warehouses. Two important New England mills who are engaged in enlarging or reconstructing their mill storage are the Oxford Paper Co. at Rumford and the Strathmore Paper Co. at their Woronoco plant. The Oxford's new plant got under way early this month. It will be fully equipped with traveling cranes for expeditiously moving paper into cars and from finishing rooms of the mill. It will be three stories in height and 182 by 35 in overall dimensions. It is expected that it will be completed before the end of summer.

The Strathmore Paper Co. had already commenced the construction of a paper storehouse at Woronoco but they decided on certain alterations which are now being made. The warehouse at this plant is in the nature of an addition to one already standing. It will be of reinforced concrete four stories in height and 200 by 42 feet overall dimensions. This will certainly give the company ample storage room for all possible mill shipment business desired and will further guarantee the service of the Strathmore distributors. Ample mill storage is more and more recognized as a necessity in view of

Instant "on and off" action

Fig. 720, Jenkins Bronze Rapid Action Valve

The Jenkins Rapid Action Valve opens or closes instantly by a short pull of the lever. It saves time, and prevents waste.

When opened, it stays automatically in position, allowing a continued full flow without the aid of set screws, locking devices, or other appliances.

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Jenkins Valves in standard, medium and extra heavy patterns for practically every valve requirement. At supply houses everywhere.

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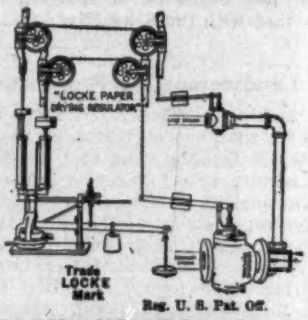
LOCKE Paper Drying Regulator

This regulator controls both live and exhaust steam for any purpose where steam is used, or it will control the direct steam when used alone. In unlike, both in construction and operation, any device that has heretofore been designed for this purpose. Controls not only temperature of the dryers when paper is running over them, but maintains the same temperature whenever there is a break in the paper. This machine is most sensitive to any change in temperature of dryers, yet it has been found to be perfectly reliable and what is more, is not continually getting out of order.



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No other agency in N. Y. C.

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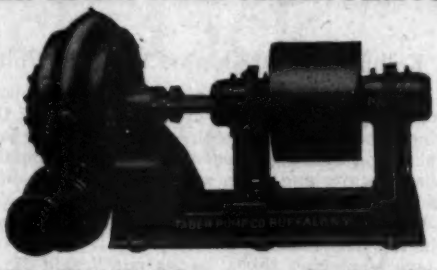

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"Pump Specialists"
Builders of Centrifugal and Rotary Pumps

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Made by machine moulded method.
No patterns necessary.
16,000 fixtures—All kinds and sizes.
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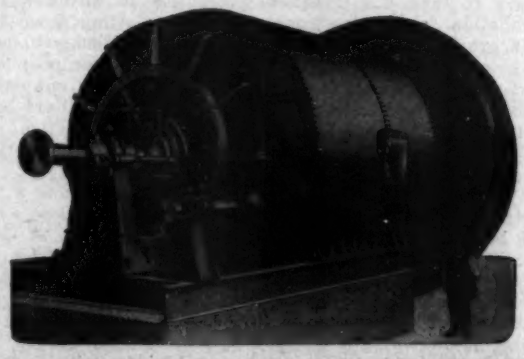

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the tendency of business today. It is requisite that a mill have all its lines in sufficient supply for quick shipment.

Installation of the new machinery at the mills of the Tileston Hollingsworth Co. at Mattapan, Mass., is now completed and it is understood that all three machines are now in operation.

Rice Barton & Fales Co., Worcester, Mass., paper mill machinery producers have recently obtained considerable new business. It is reported in the local trade that they purchased heavily of pig iron to cover their needs for second and third quarters, 1925, because of large orders principally from western mills.

Uncas Operating Favorably Under Receivership

Frank W. Browning, appointed temporary receiver of the Uncas Paper Board Co., of Norwich, Conn., at the time the company was petitioned in, has now been confirmed in his position by the Superior Court at New London, Conn. The receiver is authorized to continue the business until about the first of July. By some it was assumed that this meant a final disposition of the case before that date, either a reorganization or a sale of assets, but an examination of Connecticut law reveals the fact that a judge is limited in his powers of authorization to receivers. They must be given but limited tenure in so far as operating the business is concerned. The first two weeks in April and the last two in March netted about $14,000 profit on current operations. Receiver Browning was under the impression that profits could be made at present prices of chip and filled news board. The company has also obtained some reputation for its folding boards.

Assets of the company are not given, although it is stated in the trade that a reasonable valuation of real estate and machinery together with other assets places the total well above the liabilities which are said to be $520,000. The claims against the Uncas Company consist of 191 individuals or companies.

James E. Smith, president of the Uncas Company has already made tentative offers of settlement which on their face appear to be unsatisfactory. In the first place, he offers a 15 per cent cash settlement of all claims; second, non-cumulative preferred stock in a reorganization.

Looking Into Future at Eastern

Eastern Manufacturing Co. has completed in rather record time the construction of two piers on the Penobscot River just above their plant at South Brewer. These are for unloading of pulpwood brought from the Provinces by steamer or barge.

In connection with this fact, it is stated that any increase in pulpwood rates would be met by a larger use of the waterways.

Eastern officials state that there is no intention at present of installing coal burners at the South Brewer plant, but the company is already negotiating with engineers and manufacturers for a powdered coal burning system at the Lincoln plant. They are said to look with favor on the system which provides for a central pulverizing plant.

Opposes Intended Investigation of Freight Rates

Secretary C. L. Whittemore of The Pulp & Paper Traffic League, who is also traffic manager of the New England Paper & Pulp Traffic Association, scores the Government for class legislation which is implied by Docket No. 17,000 of the Interstate Commerce Commission under which the Commission is authorized to commence a general investigation of all freight rates throughout the country with a view to determining whether agricultural rates may be lowered and rates on other commodities raised to offset the loss in revenue.

Secretary Whittemore has prepared a memorandum which will be presented to the Commission. The paper in question calls attention to the competition faced by American paper and pulp manufacturers from Europeans, pointing out that any increase in freight rates would only affect the inland hauls on the foreign material and protests vigorously against increases on paper or pulp, sulphur, waste paper, casein, or coal.

Beacon Oil vs. I. P. Co. Suit Started

The long pending suit of the Beacon Oil Co., of Boston, against the International Paper Co. for alleged breach of contract in connection with fuel oil purchased in 1921, has at last started in the Federal District Court at Boston before Judge Morton. The Beacon Oil Company sues for $1,000,000 which they claim are damages representing the difference between the price of the oil as contracted and the various figures which the oil company was compelled to accept in the open market. According to allegations which the International Paper Co. does not deny, they refused to accept 282,000 barrels of oil for which they had agreed to pay $3.50 per barrel. It was clearly brought out by Attorney Charles F. Choate, Jr., for the International, that the great strike which commenced in the newsprint industry in the spring and summer of 1921, and which the International Paper Company fought more tenaciously than did any other mill, ending in the reopening of their mills on an open shop basis, was the cause of the paper company's refusal to accept further oil deliveries at their Rumford and Livermore mills.

Attorney Choate brought out in his examination of President Wollenberg of the Beacon Oil Co., that the Beacon had purchased no oil "earmarked" for the International Paper Co. but had intended shipping the company oil out of its huge reserve at the Everett refinery. According to Mr. Wollenberg, the oil company was forced to sell oil from 60c to $1.10 per barrel. Inasmuch as strikes are usually considered legitimate reasons for abrogation of contracts, it is felt that the International Paper Company has a good chance of success in this suit.

Amoskeag Creditors Press Claims

The Amoskeag Paper Mill, of Manchester, N. H., which last December petitioned the Pepperell Card & Paper Co. into receivership, has now asked the Federal Equity Court, at Boston, that the trustees and owners of the mill be required within a reasonable time to present either a reorganization plan acceptable to creditors or that the company be sold for what it will bring to satisfy claims.

J. H. Cashman, receiver, is the depository for all claims and Judge Anderson has ordered that creditors file complete statements on or before May 11.

The company has been operating at a slight margin of profit since it was placed into hands of a receiver. It has a nominal surplus of $127,000 obtained by placing a value of $92,000 on machinery and $58,000 on plant, as well as $63,000 notes receivable, $57,000 inventory and $69,000 accounts receivable. It has only $20,000 cash which is, however, an improvement over the condition prior to receivership.

No further action has been taken by the City of Holyoke or by the American Writing Paper Co. in regard to the debts in back taxes owed. The city and company are both preparing petitions to the Federal court asking for permission to sell property in satisfaction of taxes.

The Great Northern Paper Co. announces as it concludes its winter season of woods operations that several of its camps enjoyed a resident "social service man" known to the crews as "movie men," who supplied camp entertainment in the form of movies, music, and maintained library of magazines and fiction.

Edward Covell Rogers

The oldest living ex-president of the American Paper & Pulp Association, Edward Covell Rogers, one of the pioneer paper manufacturers of Holyoke, died at his Springfield, Mass., home during the first week of April. For eight years he had been in failing health and his end was not unexpected. He was educated at Grand Rapids, Mich., and came to Springfield when a young man. In 1859 he entered the mill of Greenleaf & Taylor, at Huntington, one of the leading mills of their time. He served in a Massachusetts regiment as sergeant in the Civil War. After the war he was again with Greenleaf & Taylor for a short time when he was chosen by the Holyoke Paper Co. as their treasurer. For two years only was he in this position, for he was recalled by his first employers and became treasurer and general manager of

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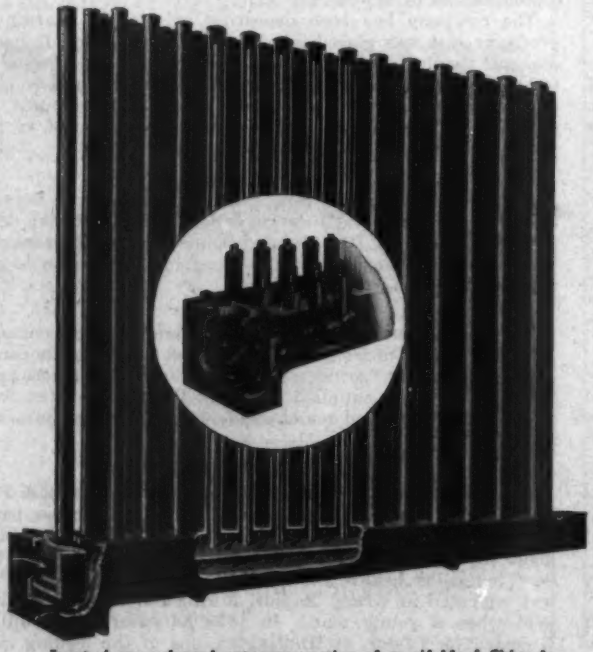
Specializing in the manufacture of paints in all colors to meet the particular requirements of paper and pulp mills.

A special service that will solve your painting problems.

Offices and warehouse stocks in all principal cities



Inset shows enlarged cut-away section of manifold of Chinook Heater, illustrating tube-within-a-tube circulating principle. Steam enters manifold where arrows indicate, distributes through supply chamber rises in ½-inch pipe, is condensed in 1¼-inch pipe radiator, returning by gravity to condensation chamber and leaving heater where arrows indicate.

For All Heating and Drying Equipment, Specify "Chinook Heaters"

The most improved form of Indirect Heaters, for use with heating, ventilating, and drying apparatus. Built on the "tube within a tube" principle, every tube a complete radiator in itself. Construction is such that there are no return bends, elbows, and nipples. Permits use of steam at either high or low pressure. The design is such that every square foot of the Chinook is prime heating surface.

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INDUSTRIAL DRYING SYSTEMS

their mills. The Chester Paper Mill, in Huntington, was absorbed in 1882 and later all his property was absorbed by the newly formed American Writing Paper Co. Mr. Rogers remained as head of the Chester plant in addition to receiving a large amount of money and securities for his mills. His company's name had been changed to the Massasoit Paper Co. preceding the merger.

Mr. Taylor maintained outside paper interests as well; he was a director of the American Paper & Pulp Association, of which he was president in 1880-89, of the Saugerties Mfg. Co., of the John Hancock National Bank, Home National Bank, and the Springfield Union Newspaper Co. He is survived by a son and daughter both residing in Springfield.

Leaves Parker Young Co.

John S. Schumaker, assistant superintendent of the Parker Young Co. mill at Lincoln, Me., has resigned his position with that corporation and started on an extensive European trip. Mr. Alfred Stanley has taken over Mr. Schumaker's duties as well as those of general superintendent. There will be no other changes or additions in the personnel.

Mr. Schumaker has made no plans at this writing regarding a new connection in the paper industry. He will return before June 1 and will attend the superintendents' meeting in Buffalo on the 4th, 5th and 6th. He is scheduled to address the meeting at this time on "Humanics and Organization Development in the Mill."

L. M. Smart, a Moosehead Lake guide, has been arrested on a warrant sworn out by the Great Northern Paper Co. for writing letters threatening to burn all the company's mills in Maine unless it reopened certain hotels which it operates at the Northeast and Northwest Carries on the lake.

Northern New York News

See Page 385 for Additional News

Reforestation Work Active

The Northern New York Utilities, Inc., one of the Carlisle group, has plans to set out 740,000 trees on its properties in northern New York. Seventy thousand have already been set out. A law was passed at the last session of the legislature which allows counties, towns, cities and villages to purchase unappropriated state land for $1 for each tract for forestry purposes, when such lands are outside the state forest preserve. Steps are being taken to reforest several large tracts in the northern counties of the state. About 35,000 seedlings have been received from the state nursery at Lowville to be planted in Oswego county. By presidential proclamation, President Coolidge has set aside Pine Plains in Northern New York as a national forest. The area embraces 10,000 acres and it has been owned by the Federal government since 1908. It has been occupied by the war department for military purposes. The land will be reforested in such a manner that the military maneuvers will not be interfered with.

The St. Regis Paper Co. has completed a contract for the purchase of 27,000 cords of pulp wood at Black Rock Bay. The wood will be towed through Big Tupper lake and will be shipped by rail to the company's mills near Watertown. Five thousand cords of pulp logs cut on the shores of Upper and Lower Chateaugay lakes have been driven down the Chateaugay river to the mills of the High Falls Pulp and Paper Company. The first pulp wood of the season from the lower St. Lawrence river region is due May 3. It is expected that 70,000 cords of pulp wood will be unloaded at the pulp wood terminal owned by the DeGrasse Paper Co. and 30,000 cords will be unloaded at the docks of the Algonquin Paper Co. During the winter $40,000 has been expended on the DeGrasse terminal to install equipment to remove bark from logs. Instead of dumping the bark in the river, it is burned to furnish steam used in developing power for the terminal.

Paper and pulp makers on the Pacific coast are optimistic in the opinion of J. D. Zellerbach, director of the Zellerbach Corporation, owner of the National Paper Products plant in Carthage. He said that there was an oversupply of paper and pulp on the coast, but the Zellerbach Corporation was paying especial attention to the selling problem.

The Herrings paper mill, recently purchased by Taggart Brothers Co., Inc., from the St. Regis Paper Co., will reopen during the present month. The machine which is expected to produce about 25 tons of jute bags a day is practically completed and the electrical equipment is now being installed. Between 50 and 75 men will be employed in the mill, the capacity of which will be about the same as that of the Watertown plant of Taggart Brothers.

A stipulation and order of discontinuance in the action brought by the Northern New York Coal Co. against the DeGrasse Paper Co., has been filed. This winds up the litigation between these two companies which has been going on for several years. The action was brought by the coal company to recover $25,000 for coal delivered. This item became a counterclaim in an action brought by the paper company to recover for alleged breach of contract. The DeGrasse company won a verdict of $80,000 which was affirmed by the highest court in the state.

The Standard Wall Paper Co., of Hudson Falls, has awarded a contract for the erection of a large addition to its mill at Joliet, Ill. By July 1, it is expected that the addition will be completed and the additional equipment which will consist of eight new wallpaper machines will be in operation. An official of the Standard Co. stated that it had been decided not to rebuild the mill at Schuylerville destroyed by fire last December, but the company will continue to operate the Standard Color Works at that place. A number of skilled workmen formerly employed at the Liberty mill will go to Joliet, Ill.

George S. Witham, Jr., and Donald McGlennan, of the Union Bag & Paper Co., Hudson Falls, Fred Chapman, of Finch, Pruyn & Co., Glens Falls, and Daniel S. Griffin, president of the Griffin Lumber Co., held a conference recently at Albany with Royal K. Fuller, commissioner of canals, in regard to the proposed improvements planned for the Barge Canal at Fort Edward. The committee requested the commissioner that machinery be installed at this point for the transfer of incoming and outgoing freight. Commissioner Fuller is said to have promised favorable action on the request which will be gratifying news to paper firms in this section desiring to make a wider use of the Barge canal.

A Ruths Accumulator Installation

Vickers & Combustion Engineering Limited has been awarded the contract for a Ruths Steam Accumulator installation to be erected at St. Lawrence Paper Mills, Ltd., Three Rivers, P. Q., in connection with Lopulco equipment for the boiler furnace. The accumulator will be constructed for 150 pounds working pressure, 4050 cubic feet volume, with a length of 48 feet and a diameter of 12 feet, the capacity being 24,000 pounds of steam.

This is the second Ruths Accumulator to be installed by the above company, the first being for Price Bros. & Co. at their new pulp and paper mill at River Bend.

In Europe, 75 pulp and paper mills have been equipped with Ruths Steam Accumulators.

Sandy Hill Elects Officers

At the annual meeting of The Sandy Hill Iron & Brass Works, Hudson Falls, N. Y., held May 1, 1925, the following directors were elected for the ensuing year: A. J. Kennedy, R. C. Tefft, Jr., C. W. Kellogg, H. L. Broughton and J. M. Ferris.

Followed by a directors' meeting the following officers were chosen for the ensuing year: A. J. Kennedy, president; R. C. Tefft, Jr., vice president; J. M. Ferris, secretary-treasurer.

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QUALITY SPEED DURABILITY MEISEL

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When in need of machinery get our quotation.

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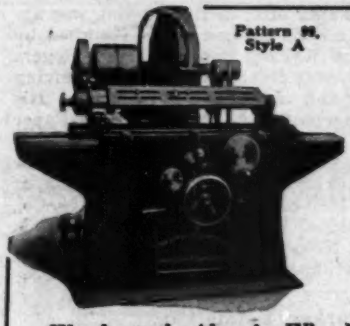

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We also make Abrasive Wheels for Knife Grinding

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Dryer 48″ diameter by 84″ face.

Same machine can be built in any desired width and with any number of dryers. This machine is equipped with Drum Winder and Double Automatic Collapsing Reel.

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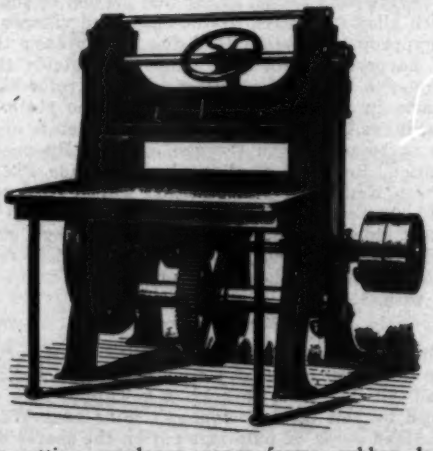

For cutting envelopes, paper forms, rubber, leather and cardboard, the Kidder Die Press has proved an economy with many manufacturers who watch their costs closely.

It will help you to cut down the cost of production. It is well built and powerful. Made for long and continuous service with a minimum of power.

Complete information upon request.

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Successors to Kidder Manufacturing Co.
Manufacturers of Kidder Die Presses, Improved Circular Sawing Machines, Boring Machines, Paper Box Machinery, Lock Washers, Rings, Cotter Pins.

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Canadian Section

May 1, 1925.

Research Section of C. P. & P. A. Getting Ready for Action

The Canadian Pulp and Paper Association has entered into a special arrangement with the Dominion government for the joint operation and control of the Pulp and Paper Division of the Forest Products Laboratories of Canada at Montreal. Under this arrangement the association assumes certain financial responsibilities in relation to the employment of a director of the division and of members of his staff, and in return is given a large degree of control in the direction of the division and in the choice of the programme of work to be undertaken.

The arrangement, which has been sanctioned by the government by means of a special order-in-council, covers a period of five years, and involves on the part of the Association a financial outlay of not less than $100,000 and is expected to materially exceed that amount.

Associated with the plan is a proposition from McGill University for co-operative research work, the laboratories already being established on McGill property, under which it is expected that a chair in cellulose chemistry will eventually be established at McGill, to be financed in part out of a bequest of $200,000 left to the university by the late Mrs. E. B. Eddy, of Hull, Que., for that purpose. The work would naturally be knit up with that of the laboratories and of the Association. It is also anticipated that some time in the future arrangements will be made for the erection of a special building for the laboratories, the present premises being considered inadequate and unfit for the purpose to which they are now being put.

The section of industrial research of the Association recently met in Montreal and transacted imporant business. Messrs. C. H. L. Jones, J. S. Bates, R. A. McInnis, R. W. Hovey and O. F. Bryant, of the section, were present, together with Messrs. W. Kynoch and E. P. Cameron, of the Forest Products Laboratories. In order to make the membership of the section more comprehensive, the following additional members were nominated and elected: Mr. Oliver Rolland, Rolland Paper Co., representing the fine papers branch; Mr. C. Nelson Gain, Canadian Vegetable Parchment Co., representing the tissues and lightweight specialties branch; Mr. A. O. Bowness, E. B. Eddy Co., Ltd., representing wrappings and miscellaneous papers branch. A representative of the paper board branch is to be nominated by the board section.

The Joint Executive Committee, representing the section and the Forestry Branch of the Department of the Interior, submitted a program of procedure for carrying on the pulp and paper division of the Forest Product Laboratories, which included: 1—An outline of the functions of the joint committee; 2—A program of work, divided into three sections; 3—A budget of proposed expeditures.

It was felt that a suitable paper-testing laboratory with all improved paper-testing equipment, is fundamental to successful research work, and the devolpment of such a department is immediately desired. The meeting approved of visits of Mr. E. P. Cameron, who has been appointed director of the research work to several other institutions with which the research section desires to co-operate.

Seven Hundred Ton Mill for International at Three-Rivers

International Paper Co. announces that its subsidiary in Canada, the Canadian International Paper Co., has let contracts for the completion of its mill at Three-Rivers, Que., to the ultimate design of eight machines and a capacity of 700 tons of newsprint a day, thus making it the largest paper mill in the world. The mill, on which construction was started shortly after the war, was originally built as a four-machine mill. On December 1st last, work was started on the installation of two additional machines, on a design calling for an ultimate installation of eight machines. The present announcement means that the company has decided to proceed immediately with the final completion of the mill.

The contract for the four paper machines has been awarded to Dominion Engineering Works, Lachine, Que., and work is under way on practically every part of the machines. The most striking feature of the machines is the fact that it is the first application, to our knowledge, of the worm drive to a high-speed paper machine. It will be of a special design, which makes use of Cleveland gears and balanced thrust bearings. The entire drive assembly is mounted in anti-friction roller bearings. Another feature is the 36-inch suction roll, which is the first application of this size of suction roll to a machine of such width.

Each machine is to be 164 inches wide, and is designed for a normal operating speed of 1,200 feet a minute; but as they will be built to withstand the stresses of considerably higher speeds than that at which they are expected to run, they will be capable of operating at 1,400 feet if required. The dryers will be set a little wider apart than usual, in order to provide for special ventilating equipment, and to give a little extra opportunity for evaporated moisture to leave the sheet. The machines will be driven by the General Electric Sectional Electric Drive.

Two of the machines are to be delivered in November, 1925, and the other two in April, 1926.

Price Bros. & Co., Ltd., of Quebec, has awarded contracts for work in connection with the paper mill to be erected at St. Joseph d'Alma, near the Petite Décharge of Lake St. John, at an estimated cost of $2,000,000. A general contract has been let to William I. Bishop, Ltd., Montreal, while an award for millwork, etc., has been given to Daigle et Paul, Verdun, Que. Equipment contracts are expected to be given out at an early date, and in this connection the Waterous Engine Works Co., Ltd., Brantford, Ont., have taken an order for a number of Voith Caterpillar Grinders.

As an outcome of the recent trip to England of Desmond A. Clarke, president of the Clarke Steamship Co., Ltd., and of Frank W. Clarke, manager of the Gulf Pulp and Paper Co., Ltd., the Clarke Steamship Co. will establish a direct steamship passenger and freight service this summer between the ports of Montreal, Quebec and Newfoundland. Arrangements have been completed to have a steamer built by a large shipbuilding concern on the Clyde.

Congratulations to J. R. Booth, Hale and Hearty at Ninety-eight

Hale and vigorous, with every mental faculty alert, John Rudolphus Booth, the founder of the large pulp, paper and lumber industry, located at the Chaudière Falls, at Ottawa, Ont., embarked on his 99th year on the 5th of April, amid the congratulations of his business friends, the members of the J. R. Booth Co. staff, and thousands of admirers and friends in Canada, the United States and elsewhere.

In accordance with past custom, Mr. Booth was presented by the office staff with a basket containing 98 American Beauty roses, one for each year of his life. Summer or winter, Mr. Booth makes a daily round of the different branches of the big plant. He was born in Waterloo on April 5, 1827, and has lived in Ottawa for nearly seventy years of his long and useful life.

At its sitting in Washington on April 7th, the International Joint Waterways Commission fixed May 15th at Montreal as the time and place for the general hearing of the New Bruns-

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wick application to develop power at Grand Falls on the St. John River. It was said by commission members that the whole question would be fully threshed out then. There is some speculation as to what effect the new Canadian export tax on power may have on the Grand Falls project, and whether the Dominion Government will make any exception in that case.

Glengarry Pulp Company Sold

The plant and property of the Glengarry Pulp Co., at Cornwall, Ont., which has a capacity of about forty tons of groundwood a day, and which has been idle for the past year owing to being in liquidation, was sold recently in Toronto to Mary Jane Ross, one of the bondholders, for $24,500. The other bidder was James Thompson, of the Thompson & Heyland Lumber Co., Toronto, also one of the bondholders.

The liabilities of the company are over $80,000 and there will be nothing left for the unsecured creditors. The proceeds of the sale went to the bondholders. Last summer the plant was offered by tender, but none were received. It is not likely that the mill will be put in operation, as it is understood that considerable new equipment would have to be installed in order to put it on a profitable operating basis.

The first forest fire occurring this season in New Brunswick was reported early last month to the Forest Service of the Crown Land Department, and the prompt action of local wardens succeeded in extinguishing a brisk blaze, which covered about an acre before being placed under control.

St. Maurice Paper Earned Seven Per Cent

In its annual financial report for the twelve months ended December 31, 1924, St. Maurice Paper Co., Ltd., shows profits after all charges, including interest and discount on the new note issue, equal to 7.7 per cent on the capital stock. This compares with a showing of 12.7 per cent in 1923, when, however, there was no note interest to pay. The balance sheet reflects the use of the funds brought in by the note issue, and there is an increase of more than a million and a quarter in working capital, the company's position in this respect being the best shown since 1920.

The pulp mill at Bear River, N. S., which was closed down for some time, is again in operation under the management of E. C. Phinney.

The newsprint mill of the E. B. Eddy Co., Ltd., Hull, Que., is being rushed to completion and is expected to be in operation early this month. The power will be brought from the newly constructed Bryson works. The sulphite plant, which has been overhauled and provided with a considerable amount of new equipment, turned out its first product some time ago and will eventually have an output of 75 tons daily. About 150 men will be employed.

The New Brunswick Pulp Wood Dealers, Ltd., have been granted a charter with a capital stock of $49,000 and head office in Fredericton, N. B., to conduct a general lumber, timber and pulpwood business. Among the incorporators are Hon. J. K. Fleming, of Juniper, former premier of New Brunswick; W. W. Boyce and George R. Sloat, of Fredericton, and Frederick W. Pirie, of Grand Falls.

The late Col. Thomas Gibson, of Toronto, vice-president of Spanish River Pulp and Paper Mills, who passed away a few weeks ago, left an estate of $161,265. Under the terms of the will, his widow is the sole beneficiary of the estate. Col. Gibson was one of the outstanding men in the pulp and paper industry, and his brother, J. G. Gibson, Toronto, is secretary of the Spanish River Pulp and Paper Mills.

R. A. McInnis, manager of Abitibi Power and Paper Co.'s mills at Iroquois Falls, Ont., has been elected chairman of the Ontario Pulp and Paper Makers' Safety Association at the annual meeting recently held in Toronto. Mr. McInnis succeeds H. F. E. Kent, of Toronto, former president of the Canadian Pulp and Paper Association. George Carruthers, of the Interlake Tissue Mills, Toronto, Ont., was re-elected vice-president.

Quebec Creating Forest Reserves

Active steps are being commenced by the Department of Lands and Forests, under the direction of Hon. Honoré Mercier, towards preparing to put into effect the legislation enacted at the recent session of the Quebec legislature in the matter of creation of forest reserves. The engineers of the government will shortly be out surveying the forest areas in the drainage basins of the province, and following this survey, steps will be taken to clean up the forests in the matter of burned-over sections, fallen trees and brushwood. It will then be a matter of arranging for this wood to be cut away, which will probably be by means of tender, and the Minister will then be in a position to meet the demands of the neighborhood mills in need of wood on the basis provided for by the law.

The purpose of the legislation in creating these forest reserves is to place aside from the ordinary Crown timber lands the forest areas at the river drainage basins so that mills actually located there will not run short of wood.

This year, for the first time, all the rangers, both those of the government and of the companies, are wearing uniforms, similar in each case except for special marks to distinguish the employer in each case.

Work Started on Wayagamack Mill

The work on the erection of the news print mill of Wayagamack News, Ltd., a subsidiary of Wayagamack Pulp and Paper Co., Ltd., has already started at Three Rivers. Contracts for the construction and installation have been awarded to Chas. Walmsley & Co., Ltd., Bury, England, for the groundwood mill machinery and newsprint machines, and the Dominion Bridge Co. for the steel work. The Foundation Co. of Canada, Ltd., are the contractors for the erection of the buildings. Some of the machinery from England has already been received.

Lord Rothermere has denied press reports attributing to him the statement that Canada cannot produce bleached sulphite for the manufacture of artificial silk. He has advised the Canadian Pulp and Paper Association that the statements attributed to him are quite contrary to his own belief, which is that in Canada there is the greatest supply of the most suitable wood for making chemical pulp for this special purpose, and that the increasing business of Canadian chemical pulp mills in bleached sulphite woodpulp specially made for the manufacture of artificial silk fully confirms his real views.

Export Tax on Pulpwood Advocated at Ottawa

In the Canadian House of Commons recently, D. W. Dickie, of Nanaimo, B. C., advocated an export tax on Canadian lumber. In order to conserve timber and prevent its wholesale exploitation, he felt that a tax of $5 per 1,000 feet, board measure, might be placed on all hardwoods and on Nos. 1 and 2 grades of spruce, pine and similar woods. On inferior logs he recommended a tax of $2 per 1,000, and on pulpwood $2.50 a cord for the cut on settlers' lands and $5 per cord on all other pulpwood.

The tax should become effective on January 31, 1927, to give present users of Canada's lumber time to readjust their business and establish mills in Canada if they wished; but in the interim he would like to see the duty applied on all exports in excess of the 1924 shipments to prevent the present exploiters from "making a Roman holiday" with our forest products.

The Anglo-Canadian Pulp and Paper Mills have taken options on property extending between the Canadian National Railways road and Beauport at Limoilou, a suburb of Quebec City, and it is expected the company will build their projected pulp and paper mills at this place.

The Trimbey Machine Works recently shipped a Proportioning and Metering System and two Consistency Regulators

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from the shops at St. Catharines, Ont., for the new mill of the E. B. Eddy Co., Ltd., at Hull, Que. Orders have been received by the company for Regulators and Metering System for the new mill of the Wayagamack News, Limited, of Three-Rivers, Que.

Ontario's Aerial Survey

Speaking in the Ontario legislature recently, Hon. James Lyons, Minister of Lands and Forests, gave some interesting particulars regarding the aerial patrol service inaugurated last year. Although hydroplanes and equipment had been purchased, the expenditures for forest fire prevention had been reduced by $208,000, and today Ontario has the greatest aircraft organization in the world. Although tenders originally received for forest patrol flying had been about $95 an hour, the government had been able to do the work itself for less than $40 an hour.

Four additional flying machines have been added to the patrol fleet, which now numbers 19. The machines were obtained at the unusually low cost of $4,000 each. They are to all intents and purposes new, and the government considers that they were obtained at a very reasonable rate, as new machines cost between $21,000 and $25,000.

Railway Would Favor Expansion of Newsprint Industry

A resolution has been passed by the Fort William and Port Arthur Boards of Trade urging upon the Ontario government the wisdom of granting to the builders of the Duluth and Ontario Railway 6,400 acres per mile, to be selected in alternate townships, or larger blocks within twenty miles of the railway, for a distance of 250 miles, said grants not to embrace limits already applied for by existing mills; but on condition that the company build a railway and secure the erection of additional pulp and paper mills in Fort William and Port Arthur, or in the immediate vicinity, until the total local production reaches 1,000 tons of newsprint daily.

The proposed railway would run northerly from the international boundary into the interior of the basin of the Albany river, which is about 600 miles long, and would render accessible a large area of Crown lands now practically inaccesible.

The Canadian Paperboard Co., Ltd., with mills at Montreal, Frankfort, Ont., and Campbellford, Ont., have redeemed the second installment of their outstanding $800,000 seven per cent bonds, amounting to $30,000, in accordance with the trust deed. A similar installment is required to be taken up on the 1st of April of each year.

Good progress has been made on the construction by the Newfoundland Power and Paper Co. of a newsprint mill at Corner Brook, Newfoundland, with a daily capacity of 400 tons. There will be four machines, each of 100 tons capacity, and 234 inches wide. The company has timber rights over 2,000,000 acres of limits, which will yield at least fifty years' supply.

Word has been received that the expert engineers who have been investigating the technical phases of the proposed pulp and paper mill at Winnipeg have practically completed their preliminary report and that this will be submitted at an early date to the various committees formed to deal with the enterprise. It is stated that the preliminary report justifies all the claims made by J. D. McArthur in respect to the pulpwood possibilities of Manitoba and that all the evidence indicates that a pulp and paper mill on a large scale could be successfully operated.

Owing to a freshet on the Credit river, the plant of the Provincial Paper Mills at Georgetown, Ont., had to close down, but only for half a day. A recent wind storm did some damage to the roof of the storage and beating rooms of the company's plant at Mille Roches, Ont.

During the recent visit of A. R. Graustein, president of the International Paper Co., to New Brunswick, he had a conference with H. W. Brankley of Chatham, manager of the Miramichi Lumber Co., a subsidiary of International. It was announced that all of the pulpwood cut during the fall and winter by the Miramichi company would be shipped to the Three-Rivers mill of International. Indications are that all the wood will be shipped by water from Chatham during the spring and summer. About six million feet are involved.

Rubber Roll Industry for Montreal

The growth of the newsprint industry has brought to Canada a subsidiary industry which is about to establish itself in the close neighborhood of Montreal. The new company is known as the Rubber Products Co. of Canada, which has been organized to provide "Made in Canada" products of a highly specialized type required in the manufacture of newsprint, namely, rubber covering for the rolls on the big newsprint machines.

Associated with the new enterprise will be the oldest concern in North America specializing in the application of these rubber coverings, the American Wringer Co., Inc. It is understood that this company will arrange all the financing for the Canadian company, and arrangements are now well advanced to make a start at this new line. It is understood that the operations will be carried on at Lachine.

Price Bros. & Co., Ltd., have ordered one Ruths Steam Accumulator for their mill at Lake St. John. The accumulator is to have a volume of 7,500 cubic feet and a capacity of 37,000 pounds. The company have also ordered two type "E" stokers, class 9, size 10 ft. 10, for the Lake St. John mill.

The rush of ice down the St. Lawrence and St. Maurice rivers wrecked the marine conveyor of the St. Maurice Paper Co., at Three-Rivers, Que., causing damage estimated at about $25,000.

International Caims $1,500,000 from N. B.

Indications are that the report that Mr. Graustein has asked the New Brunswick government for approximately $1,500,000 in return for the company's lands, leases and privileges at Grand Falls and between that point and Van Buren on the St. John river, is not far astray, if any, regarding the figure. Some years ago it was announced on behalf of International by P. T. Dodge, who was then president, that the gross expenditure of the company at Grand Falls and along the St. John river, in connection with the proposed development of the water powers, was over $1,000,000. A decision is expected to be reached between the company and the provincial government very soon.

There seems to be little doubt that International plans a pulp and paper mill for Grand Falls. The sole proviso seems to be that the cost of the power from the province-exploited hydro-electric possibilities at Grand Falls be low enough to appeal to the heads of International. It is hardly likely that the mill will be started until this cheap power has been assured.

The new president of Charles Walmsley & Co. (Canada), Ltd., is Sir Glynn West, who is chairman of the parent company in England, Sir W. G. Armstrong, Whitworth & Co., Ltd., as well as of most of the associated companies.

D. W. Campbell, for twenty-eight years general manager of Elder Dempster & Co., Ltd., in Montreal, died last month at his home in Westmount, Que. He had been seriously ill since January 10th last, when he had suffered a paralytic stroke. For a number of years Mr. Campbell had been a director of Howard Smith Paper Mills, Ltd., and took a keen interest in the development of the business and pride in its success. His genial nature and helpful advice were much appreciated by his associates.

Permission has been granted by the New Brunswick legislature to the Fraser Companies, Ltd., to build a dam at Red Rapids on the Tobique river, where they are to locate a new mill in connection with the utilization of the recently acquired Stetson-Cutler properties. The Tobique river is famous for its salmon fishing, and the company must provide fishways which will make possible the free movement of salmon up

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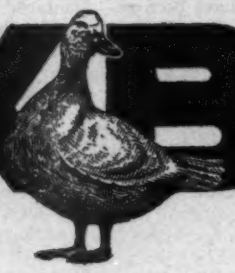

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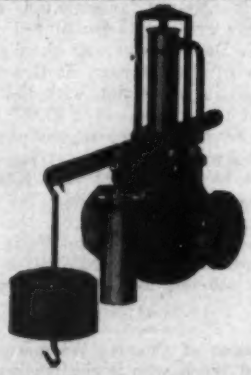

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and down the river. The plans will have to be approved by the Lieutenant-Governor-in-Council before the work can proceed.

A delegation representing the Canadian pulp and paper industry recently waited on the Department of Finance, at Ottawa, to protest the extra duty which the new budget places on slack coal. They were courteously received and heard by Hon. Mr. Robb, the acting Minister, who requested them to present a formal brief.

The pulp terminal opposite Prescott, Ont., has resumed full-time operation in an effort to move out as much as is possible of the 30,000 cords of wood which remain in huge piles. It is estimated that approximately 70,000 cords will be received at the terminal this season.

A. J. T. Taylor, Toronto, president of Vickers and Combustion Engineering Co., tentatively suggested that Winnipeg interests, if they so desired, could finance the major portion of the proposed pulp and paper mill by applying for a grant under the British Trades Facilities Act.

Little Rapids Company Builds on Manitoulin Island

The new groundwood pulp mill which is being erected at Kagawong, Manitoulin Island, is being undertaken by the Little Rapids Pulp Co., of Little Rapids, Wis. The report that the Fox River Paper Co., of Appleton, Wis., was behind the enterprise is not correct, as the officials of the company say they are in no way connected with this development.

McLarty Bros., builders and contractors, of Sault Ste. Marie, Ont., have been awarded the contract, and the mill will grind about twenty cords of wood a day. The contract includes 1,800,000 feet of water power, canal, and wood and steel flumes and docks. The company will furnish and install their own machinery.

A. L. Dawe, of the Canadian Export Paper Co., and C. A. Price and Frank Thorn, of Price Bros. & Co., have returned from a three weeks' tour of friendly visits to the customers of Canadian export paper in the United States. Their tour covered parts of the middle West, where they found a very lively market condition.

In order to lessen forest fire menace, the New Brunswick legislature has declared a closed season for bears from May until November. Many people have been using bear hunting as an excuse for being in the woods at a time when forest fire hazard is at its worst, and it has been found that the fewer hunters, campers and others in the woods, the fewer the chances of fires originating.

The number of cars handled in and out of the mill yard in 1924 at the plant of the Abitibi Power and Paper Co., at Iroquois Falls, Ont., was 29,021, which, if made up into one train, would measure 231 miles.

J. S. Wilson, who has been chief engineer of the mill of the Dryden Paper Co., Dryden, Ont., for the past five years, has succeeded H. F. Bullard as manager.

At their annual meeting, the Three-Rivers branch of the Canadian Manufacturers' Association decided to ask the American government to appoint a consul, or at least a vice-consul, in that city. The export trade of Three-Rivers to the United States, particularly the exports of pulp and paper, render this appointment necessary, according to James Murray, manager of the St. Maurice Lumber Co.

Fort William Operating to Capacity

The second newsprint machine of the Fort William Paper Co., Fort William, Ont., has resumed operations after being shut down for some time owing to lack of power. The output is now about 160 tons a day. In a short while the organization will begin its wood-preparing operations and several more men will be added to the working staff. Officials of the company state that the increased scale of operations is ascribed

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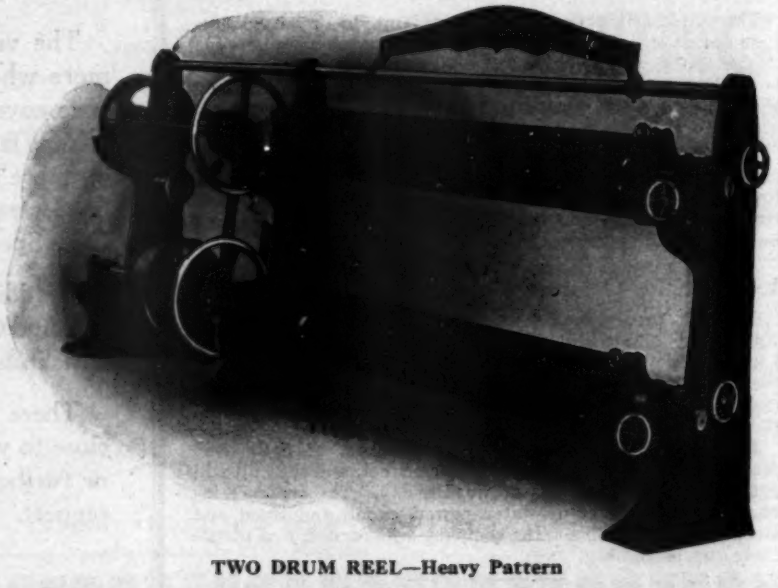

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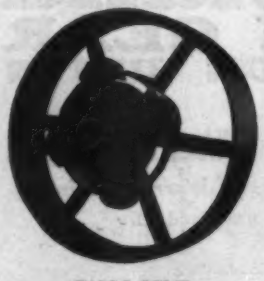

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to the greater volume of water now available as the result of the spring freshets.

It is hoped that the power supply will be constant throughout the year so that the two machines can be kept in constant operation. The market demand is good and all that is needed is a permanent ample power supply. The officials of the company are not ready yet to discuss the possibility of the proposed extension to the plant and the installation of more machines.

By taking advantage of options on lands located next to the Bertheirville Government Nursery, the Quebec Department of Lands and Forests completed a deal recently which increases the area of the nursery from 80 arpents to 320 arpents.

After touring the forestless regions of China for a couple of months, Frank J. D. Barnjum recently returned to this country, and stated that Canada is fast approaching a condition of forestlessness similar to that existing in China.

March accidents at the big plant of the Abitibi Power and Paper Co., Iroquois Falls, Ont., were less than in the corresponding month of 1924, but showed an increase over those in February, 1925. The number of accidents during the first three months of 1925 has been 39, with 3,437 hours lost and $2,087.20 lost wages.

Several million feet of logs and pulpwood on the St. Mary's river system, in Guysboro, N. S., were recently swept out to sea by floods caused by spring freshets, which were reported to be the worst in some years. It is thought a large portion of the timber may be recovered.

Bathurst May Acquire Chandler Mill

It is reported that negotiations are proceeding looking to the acquisition of the St. Lawrence Pulp and Lumber Corporation by a group to be headed by Angus McLean, president of Bathurst Co., Ltd., Bathurst, N. B. In the event of the negotiations coming to a successful conclusion, it is not known whether the property will be operated as a part of the Bathurst Co. or by a separate company to be formed.

The St. Lawrence mill in the Gaspé peninsula is not inconvenient to the Bathurst mill, the two being separated by the Baie des Chaleurs. The St. Lawrence Pulp and Lumber Corporation owns the sulphite mill known familiarly as the Chandler mill, and has been at loose ends during the past few years because of the difficulties that faced the Saguenay Pulp and Power Corporation and the Bay Sulphite Co. The mill has been operated under lease by the Bay Sulphite Co.

H. G. Schanche, who for the past two years has been manager of the woods department of the Abitibi Power and Paper Co., Iroquois Falls, Ont., was lately appointed general manager of the Abitibi Transportation and Navigation Co. The promotion is in line with the centralizing of control of all woods operations. During the past winter the railway had a most successful season. In addition to the main line there were 12 miles of spurs. There were four main camps and two secondary camps, and from these 50,000 cords of pulpwood were cut. In addition settlers near the railway cut 4,600 cords, which were purchased by the company.

A stand of Vancouver Island timber has been purchased by Frank J. D. Barnjum, to be preserved and converted into a park as an example to posterity of the tall monarchs that existed in British Columbia before they were leveled by the woodman's axe.

Backus Enterprise to Expand

What is believed to be the largest single issue of bonds, namely, $16,000,000, ever brought out for the development of the pulp and paper industry has been sold by the Minnesota and Ontario Paper Co., with main offices at Minneapolis, and which operate pulp and paper mills at International Falls, Minn., and Fort Frances and Kenora, Ont.

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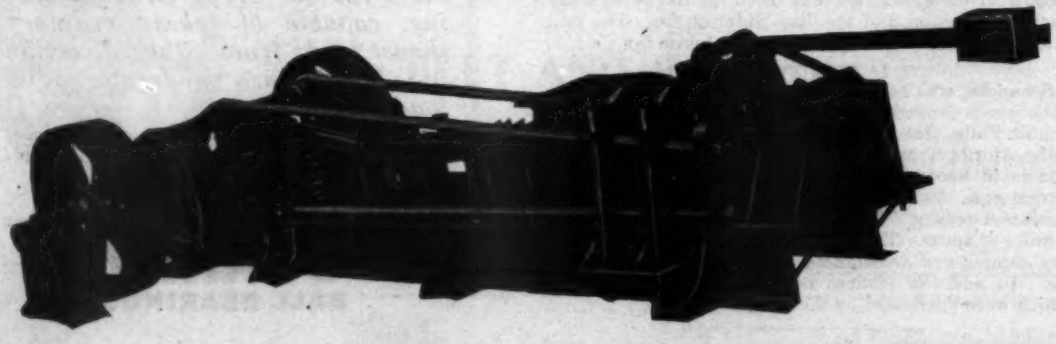

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have an annual capacity of 200,000 tons of newsprint, 30,000 tons of sulphate pulp, 60,000,000 feet of insulating board and more than 125,000,000 feet of rough and finished lumber. The company are also adding 45,000 horsepower in hydro-electric facilities to their present developments and a supplementary steam station of 7,000 horsepower.

This is one of the enterprises controlled by the Backus-Brooks interests, headed by E. W. Backus.

The mill of the Chicoutimi Pulp Co., at Chicoutimi, Que., which had been shut down for two months, has resumed operations and is expected to be soon operating to capacity.

The Three-Rivers City Council decided to close Notre Dame Street, which is part of the National highway between Quebec and Montreal. The closing of the street will enable the St. Lawrence Paper Mills to double its present plant, at an estimated cost of $2,500,000. The mill has taken out a building permit for $519,000 and work is beginning.

The Buntin Reid Co., Toronto, report that their efforts to market Canadian-made paper in competition with English imitation art are meeting with gratifying success. They have also introduced a new made-in-Canada product, under the title of "Balmoral Cover." This cover paper is of walrus finish and is being sold in competition with fancy finished or leather finished covers which have all previously been imported from the United States.

Mr. M. Yanamura, of Tokio, Japan, was a visitor to the Laurentide mill a short time ago. Mr. Yanamura is the chief engineer of the Fuji Paper Co., of Tokio, Japan. He is traveling in the United States and Canada to note the latest North American practice in paper making.

Dominion Engineering Works Busy

During the past year, the Dominion Engineering Works have done miscellaneous paper machine construction, which has amounted to just about the equivalent of one complete machine. They have finished two 36-inch suction couch rolls for the new 234-inch machines for Price Bros., and are building two 36-inch couch rolls and two 30-inch suction press rolls for the 164-inch machines recently ordered from Chas. Walmsley & Co., Ltd., for the Wayagamack news mill.

They have in hand orders for 44 Frederick pumps, and are building two 32,000-kilowatt electric steam, generator units for Price Bros. & Co. These are equivalent to approximately 6,400 boiler H. P. and will be operated at 13,200 volts, delivered direct from the generators at the Grande Décharge power plant, taking the total output from two of the generator units.

D. W. Ambridge, of the Abitibi Power and Paper Co., Iroquois Falls, Ont., has been elected to membership in the technical section of the Canadian Pulp and Paper Association.

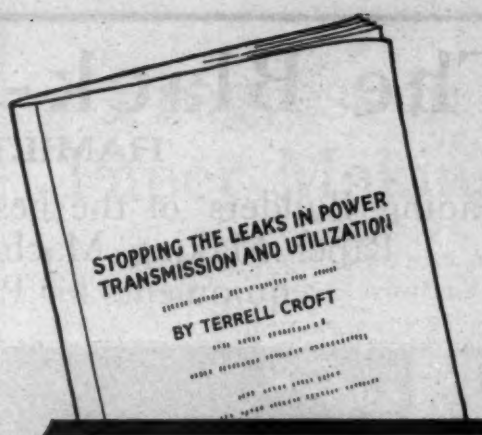
A recent issue of the "Canada Gazette" contains the announcement of the incorporation of Lincoln Mills, Ltd., paper manufacturers, Merritton, Ont. The company is capitalized at $1,450,000, and the reorganization is the outcome of the receivership appointed some months ago.

The Dominion Envelope and Carton Co. have about completed the construction of their new addition to the plant on Duchess street, Toronto, Ont.

It is reported that International Paper Co. have had engineers looking over the old Riordon sulphite mill at Merritton, Ont., which has been out of commission for some time. It is rumored that there is a possibility of International reopening the mill following investigation as to power possibilities.

The Backus-Brooks Co., of Kenora, Ont., has placed an order for a second newsprint machine, 234 inches wide, with the Bagley & Sewall Co., of Watertown, New York, for delivery in December.

Permission to erect a dam, a power house, canals and other works for power development is sought by the Quebec Devel-



Cut Down Your Power Costs

You can undoubtedly cut power costs a substantial amount by rigorously inspecting your power transmission system for power leaks. This is neither difficult nor expensive. It needs only simple equipment, and you can carry out the tests yourself by simply following the procedure outlined in Terrell Croft's up-to-the-minute book, "Stopping the Leaks in Power Transmission and Utilization."

Let us send you a copy with our compliments.

It discusses the various types of drives; points out the good features and the shortcomings of individual and group drives; indicates where each may best be used. It shows in clear and simple detail, with dozens of diagrams, just how to follow through and test the efficiency of your power transmission system; how to locate every avoidable leak—leaks that often waste hundreds and thousands of dollars a year.

As the edition of Mr. Croft's book is limited, copies are reserved for engineers, plant executives, and educational institutions.

The Leather Belting Exchange has nothing to sell. It is a service organization, having as its sole function the aiding of power users toward the more economical, efficient, and satisfactory distribution and utilization of power. Mr. Croft's book is an aid to this end. Simple and practical, it may lead you to better results at lower costs. May we send you a copy?

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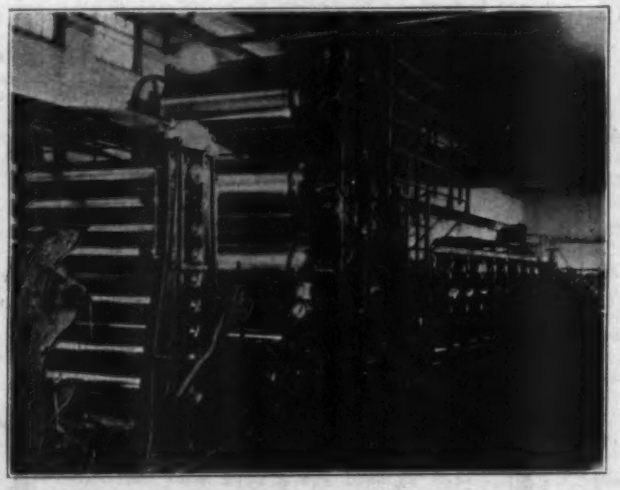
Leading Builders of the best **Fourdrinier** and **Cylinder** Paper Making Machines and other accessory equipments for Paper and Pulp Mills.



A Great Success

Our patent vertical dryers installed on a Fourdrinier machine making cover papers.

No felts used on them.

Steam pressure reduced from 15 pounds to less than 5 pounds.

No cockling of the paper.

Sheet threaded by Sheehan patent carrier system.

Increased production and better paper.

BARRE GRANITE IN PRESS ROLLS

Is Revolutionizing the Whole Paper Making Industry

If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company

BARRE, VT. **BOSTON, MASS.**

opment Co. These works are to be erected at a point along the Saguenay river, near Chute-à-Caron, a short distance from the Shipshaw river. It is understood that work on the dam will start very shortly and will be prosecuted without delay.

One of the four machines of the Newfoundland Power and Paper Co. is ready to run, and a second will be ready at the beginning of this month.

The new machine recently installed by the Anglo-Newfoundland Pulp and Paper Co. is understood to be in operation.

The week of April 19th to 25th was observed throughout the country as "Save the Forest Week," and in support of the Governor-General's proclamation public bodies and private organizations, throughout the Dominion, co-operated in an effort to educate the public to the value of forests as the source of raw materials fundamental to most of the industries and enterprises of Canada. Public addresses, talks by school teachers, speeches by statesmen, sermons by ministers, editorials and articles in newspapers and magazines, and speeches broadcasted by means of the radio, all contributed to the great object of saving Canada's forests.

Ernest Erickson, until recently at Kapuskasing, Ont., with Spruce Falls Co., Ltd., has just been appointed chief chemist of Mattagami Pulp and Paper Co., Ltd., with mills at Smooth Rock Falls, Ont.

Price Bros. Had Difficult Year

In view of the extraordinary handicaps under which Price Bros. & Co., Ltd., operated last year, with the landslide at the Kenogami mill, resulting in serious curtailment of production for a time and doing damage to property placed by the directors at $1,300,000, the showing for the twelve months ended February 28, 1925, can hardly be regarded as other than a favorable one, although less than one per cent was earned in excess of the company's common dividend requirements, after allowing for two months' dividends on the preferred stock.

The exhibit is the more encouraging for the fact that net working capital has been doubled, with current liabilities little more than half what they were at the end of the 1923-24 period.

A federal charter has been granted to the Cellucotton Products Co., with a capital stock of 1,000 shares, without par value, and headquarters in Niagara Falls, Ont. John B. Thompson and John B. Hood, of Niagara Falls, Ont., Harry Price and Ernst Mahler, of Neenah, Wis., and Stephen R. Stilp, of Niagara Falls, N. Y., are the incorporators of the company. It is understood that this organization is closely allied with the Kimberly-Clark Co., of Neenah, Wis. It is empowered to manufacture, sell and deal in all kinds of paper, paper materials, and paper substitutes, and in raw substances, pulps, preparations, mixtures, solvents, etc.

J. B. McGregor, for a number of years on the selling staff of the Regal Paper Box Co., Toronto, has purchased the City Paper Box Co., Toronto, and has changed the name of that concern to the McGregor Paper Box Co. His many friends in the trade will wish him every success in his new venture.

The appointment of E. H. Finlayson as director of forestry for the Dominion of Canada has been announced. Mr. Finlayson has held the position of acting director since 1922, and succeeds R. H. Campbell, who resigned owing to ill health about a year ago.

The Joint Committee on Approved Chemists recently accepted for listing Dr. A. R. M. MacLean, of J. T. Donald & Co., Ltd., 40 Belmont street, Montreal, Can.

The name of Boyd & Brainard, Inc., paper jobbers of 28 Beekman street, New York, has been changed to the Brainard Paper Co. The concern is the successor to the E. W. Scarborough Co., and specializes in fine papers.

Progress in Paper Making

WITH progress in American paper making, we are concerned and connected. To commemorate the advances that have been made, the more important annals of the industry will be recalled from month to month in this space.

Improvements at the Wet End

The first Fourdrinier machines were entirely dependent upon gravity to drain the water from the web on the wire.

In 1826, M. Canson, of France, improved on this method by rarefying the air below the surface of the web by means of suction pumps. It is said that he kept this invention secret for six years.

The Dandy Roll, according to R. W. Sindall, was invented this same year by J. Marshall, although in Munsell's "Chronology," it is credited to an English machinist, John Wilkes, in 1830.

Established 1842

Cheney Bigelow Wire Works

Experienced and Progressive

Fourdrinier and Cylinder Wires
Dandy Rolls and Cylinder Moulds
made and recovered

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"You can say good-bye to rust when you paint with BITUMASTIC"

The Paint Question

Your search for a paint that will stand up under moisture, chemical fumes and heat conditions comes to an end when you begin using BITUMASTIC SOLUTION. It gives enduring protection to metal buildings and roofs, structural steel, tanks, pipes, stacks, boiler fronts and breechings and other steel surfaces. It has a fine glossy finish that lasts. The sooner you start using BITUMASTIC, the sooner your worry over the paint question ceases.

The most convincing argument in favor of the use of BITUMASTIC SOLUTION is the performance of the paint itself. We are willing, therefore, to send a sample can, without charge, to interested executives and engineers.

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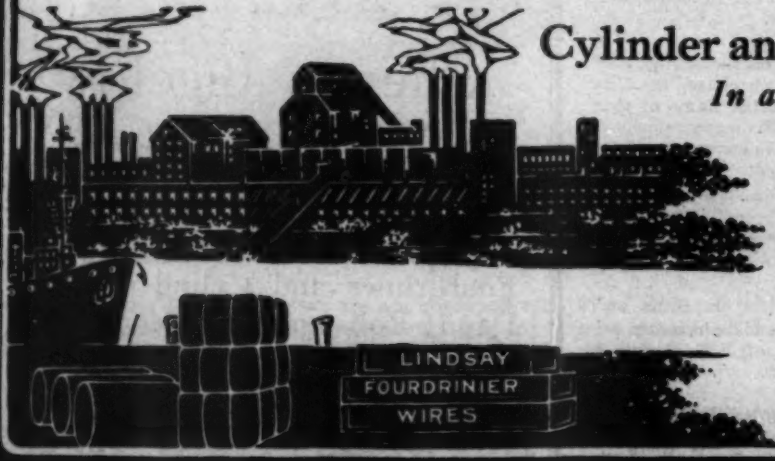
DURABLE AND DEPENDABLE

Made in all sizes



Cylinder and Washer Wires

In all Meshes

The Lindsay Wire Weaving Company

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Cost Accountants Elect

Edward H. Roorbach, of Brownville, was elected president of the Northern New York branch of the Cost Association of the Paper Industry at a recent meeting. Mr. Roorbach succeeds J. C. McCormick. Miss Amy Lofink was re-elected secretary.

H. F. Farrington, C. P. A., delivered an address on income tax legislation. T. J. Burke, of New York, secretary-treasurer of the Cost Association of the Paper Industry, also spoke. The Northern New York branch is being revived after having been dormant for four years.

The Bagley & Sewall Co., of Watertown, has just closed a contract with the Keewatin Lumber Co., Kenora, Ont., for a paper-making machine. The tentative contract calls for a machine 245 inches wide, making it the widest machine in the world. The width of the machine depends on the size of the mill and engineers of the Bagley & Sewall Co. who went to the mill to make a survey report the 245-inch machine can be installed. The widest machine yet made is 244 inches. The Keewatin mill is the Canadian branch of the Backus-Brooks Co. The machine will have a speed of 1,000 feet a minute or over 100 tons a day. This is the second large order the Watertown concern has booked within the last few weeks, the first being for a high-speed machine for the St. Regis Paper Co. The Bagley & Sewall Company is now on full time.

Northern New York News

May 1, 1925.

John J. Warren, president of the Harmon Paper Co., of Brownville, president of the Warren Parchment Co., and consulting expert of the St. Regis Paper Co., sailed last month for Europe to spend the next two months in Germany, Norway and Sweden on business connected with the marketing of the Warren magazine pulpwood grinder of which he is the inventor.

The power house of the Sonoso Paper Co., of Phoenix, was destroyed by fire April 20. Flames threatened to destroy the entire mill. About thirty men were thrown out of work.

Dr. James E. Campbell, president of the Dexter Sulphite Pulp and Paper Co., has been appointed one of the two delegates to represent the American Paper and Pulp Association at the International Chamber of Commerce at Brussels, Belgium, in June. The appointment was made by Norman W. Wilson, president of the association.

David Jamieson with Newfoundland Mill

David Jamieson, formerly of Raymondville, N. Y., and for the past few years superintendent of the Kenora mill of the Keewatin Lumber Co., near Winnipeg, has taken a position as assistant superintendent of the Newfoundland Power and Paper Co., at Corner Brook, N. F. The plant is British owned, the government owning about $15,000,000 worth of stock in the company. The plant is under construction and will be completed in July.

Mr. Jamieson was boss machine tender in the Remington & Martin mills at Raymondville, now the Hanna company, for about ten years. In 1913 he left to take a similar position with the Spanish River Paper Co., at Sturgeon Falls, Canada. He was with that firm about ten years, then going to Three-Rivers, P. Q., as assistant to Roy McCormick. He remained there about a year and then went to Kenora as night superintendent of the pulp mill division.

A general move consolidating all the New York offices of the F. L. Carlisle interests is expected soon. This would place the New York offices of the St. Regis Paper Co., the Power Corporation of New York and the F. L. Carlisle Co. under one roof. It is said that an entire floor at 49 Wall street would be occupied by the company.

Plans for offering the common stockholders of the St. Regis Paper Co. 31,600 shares of new common stock at $25 a share

Quality Pulp

Through Barker-Internationals

Latest approved designs—simple—few parts.

High grade workmanship and materials.

Uniform suction and blast.

Made in sizes from 6 to 18 plates.

Repeat orders are our best endorsement

Barker Quick Opening Stock Valve

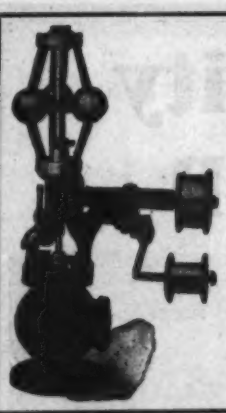
Plug and seat ground to fit, practically non-plugable, quick acting. Made of cast iron and bronze plug, all bronze or all cast iron. Sizes 6 to 12 inches. Its simplicity and strength are apparent at a glance.

Write for Bulletin with complete description.

Green Bay Barker Co.

Green Bay, Wisconsin

Makers of the famous Green Bay Barker



How Much *Paper* Are *You* Losing Because of Uneven Thickness?

During the past three years we have developed wide experience in building Governors for Engines and Turbines in Paper Mill service, resulting in uniformly thick paper, and a considerable increased production.

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PRESSURE PIPE THAT NEVER BURSTS
Built in sizes 1 inch to 48 inches

WYCKOFF WOOD PIPE

The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for Paper Stock and Acids that can be obtained.

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ECONOMIZERS

Reduce fuel costs by making use of waste exhaust gases to preheat the boiler feed. Patented construction proven by 20 years of service.

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SUPERHEATERS

Improve engine, turbine and boiler economy by enabling a given amount of steam to do more work. Over 10,000 installations in stationary power plants.

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for that troublesome

CONE DRIVE---

there is a new size in

CRESCENT BELT FASTENERS

designed to take care of that torsional strain that causes so much joint and belt trouble.

Write for special Paper Mill Catalogue

CRESCENT BELT FASTENER CO.
247 Park Avenue
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Protect Yourself—DEMAND ALBANY GREASE

The 100% Lubricant Never Drips

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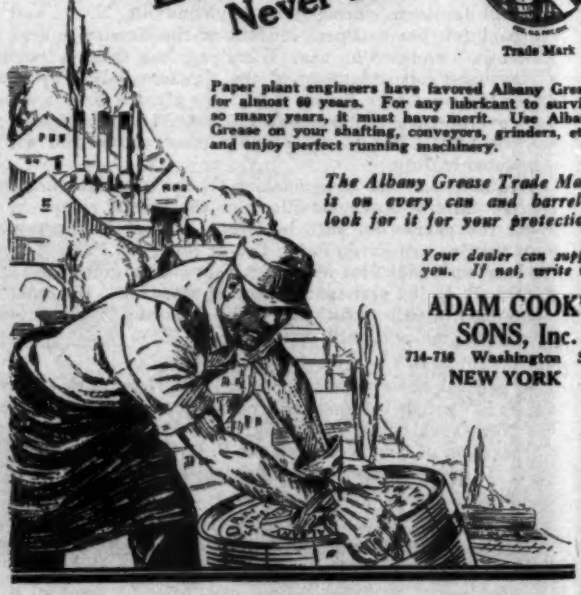

Paper plant engineers have favored Albany Grease for almost 60 years. For any lubricant to survive so many years, it must have merit. Use Albany Grease on your shafting, conveyors, grinders, etc., and enjoy perfect running machinery.

The Albany Grease Trade Mark is on every can and barrel—look for it for your protection.

Your dealer can supply you. If not, write us.

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714-716 Washington St.
NEW YORK

on a basis of one share of new stock for each ten shares of old stock have been announced by Floyd L. Carlisle, president of the company. The old stock is currently quoted at $35 a share, so that the rights to subscribe to the new stock are worth approximately $1 a share. The St. Regis Paper Co. owns a controlling interest in the Power Corporation of New York.

Paper Made of Straw

Frank W. Warren, of Paris, France, an international expert on fibres, pulp and paper, came to this country last month. He is a brother of J. J. Warren, president of the Warren Parchment Company. Frank J. Warren maintains an advisory bureau in France and has an international reputation. In speaking of the paper industry he said:

"I can see no prospect of a pulpwood shortage for some time to come. The thing which gives the appearance of a pulp wood shortage is the location of the timber. In this section the pulpwood is getting scarce and the mills are turning to the manufacture of the higher grades of paper, but in the great northwest one would almost say that there was a surplus of timber.

"One of the most interesting things which we have studied in our work during the past year is the making of bleached paper from common straw. It is very cheap to produce and makes suitable paper for books, writing and other fine grades of paper. It is cheaper and better than some of the old process soda pulp, but I do not expect it to take the place of wood pulp.

"There are six or seven mills for its manufacture in Europe and it is now being taken up in this country. The process is known as the DeVains process and it is a big step in the industry in that it allows the use of fibers which have previously been used only in inferior papers, such as straw board.

"Practically every year some new form of fibre comes into use. The bamboo pulp has been brought to a successful commercial production in the past five years. Naturally some of the fibers used in the future will be tropical plants and reeds which grow rapidly and are yet unexploited.

"The paper industry in Europe is not very brisk now as an aftermath of the war. There are few new installations there and we do most of our work looking after mills which have gone wrong in process or are not showing the proper rate of profit. A great deal of our work is done for banks which are financing these mills, and we also look after the mills manufacturing cigarette papers for the American Tobacco Company.

"While our headquarters is in Paris, we work all over Europe. Since the war we have worked in Switzerland, Poland and even in Japan and the Orient.

"In Japan the industry is in very good shape. All the mills there are paying good money and all we did was to assist in the manufacturing process. We handled technical work for the mills of the Oje Paper Manufacturing Company there.

"One of the most absorbing things I saw in Japan was the modern mills with everything up to date, and right beside them the oldest paper mills in the world. One of the mills has positive records dating back 900 years. Another has records and traditions dating back 1,100 years. These mills are operated by hand with the methods and tools that were used years ago. One workman will make about 400 sheets, 20 by 24 inches a day, or a total of 25 pounds, while in other mills with modern machinery they turn out as high as 100 tons a day.

"I was admitted to these mills through the courtesy of the president of the Oje company and was one of the first foreigners allowed to visit them. They are located way up on the west coast at Naijo and Takefu. The paper they make there is the most artistic of the hand made paper and demands high prices. Gold leaf and silver leaf papers are made there from native grasses called gumi.

"During the past year, besides my trip to the Orient, I have investigated fibers from the Philippines, South Africa and South America."

Mr. Warren began his work in the paper industry in northern New York. In 1900 he went to Sweden and with the exception of three years he has since remained in Europe. He is internationally known as a paper mill expert and has spent many years in compiling data on paper, paper making and

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Bars	Boiler Tubes
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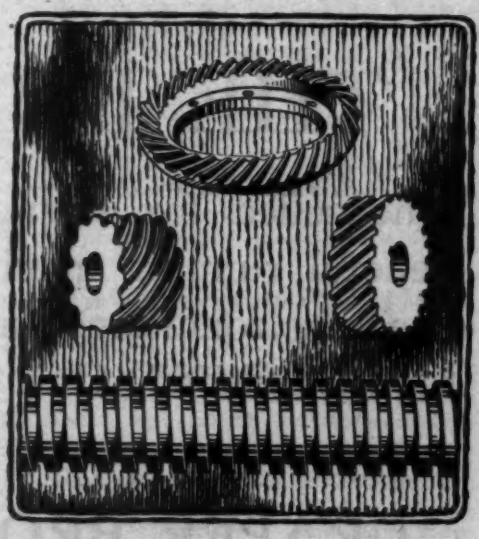
Write for the Ryerson Journal and Stock List —the "Key" to Immediate Steel
JOSEPH T. RYERSON & SON INC
CHICAGO ST LOUIS CINCINNATI DETROIT BUFFALO NEW YORK



It's Performance That Counts
William Ganschow Company
24 N. Morgan Street Chicago, Illinois
MEMBER OF AGMA
Manufacturers of Cut Gears and Speed Transformers
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THE interest and depreciation alone on many high-speed Fourdrinier Machines amounts to more than $300.00 per day.

Enforced idleness for any reason whatsoever quickly piles up a tremendous overhead—it makes deep inroads into profits—it minimizes the advantages gained through high-speed equipment.

Speed is of little value if endurance is lacking, and a speed of 700 to 1,000 feet per minute is far too severe for ordinary Fourdrinier Wires.

Why not keep what you gain through high-speed, by using Tyler Phosphor Bronze Fourdrinier Wires—they are made expressly to withstand the severe strain and service required on high-speed machines—they have far greater endurance—they will help you to show the largest possible net profit from the operation of your machines.

Many paper mill superintendents, knowing the importance of using only the highest quality of Fourdrinier Wires, specify "Tyler."

Tyler Phosphor Bronze Fourdrinier Wires can be supplied promptly in all widths up to and including 250".

THE W. S. TYLER COMPANY, *Cleveland, Ohio*

TYLER FOURDRINIER WIRES

CYLINDER WIRES BACKING WIRES WASHER WIRES CORDUROY WIRE CLOTH HUMMER ELECTRIC SCREENS

THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

Made by

DRAPER BROTHERS COMPANY

CANTON, MASS.

Woolen Manufacturers Since 1856

REPRESENTATIVES

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the processes used, and has most comprehensive information on fibers, pulp and paper.

After a short visit with relatives in Watertown he went to Montreal. During his presence in America he will make a number of investigations for paper mills. His visit here will be of about five weeks duration and he will then return to France.

Wage Scale Unchanged

The same wages will prevail in the mills of the Sherman Paper Co., at Felt's Mills, for the 12 months from May 1, as during the last year. The agreement between this company and the various unions is a one-year affair, carrying adjustment May 1 of each year. It was announced at the headquarters of the paper makers' union that inasmuch as neither side had asked for a readjustment of wages, the same scale would continue.

The agreement entered into between the unions and the mills of the Carlisle group will provide for no change. The mills in the Carlisle group are at Norfolk, Raymondville, Norwood, Black River and Deferiet. This agreement carries a continuation clause to the effect that if neither side files a motion within thirty days prior to the expiration of the agreement, there shall be no change.

Headquarters of the International Brotherhood of Paper Makers at Albany reports that friendly settlements will be made. Up to the latter part of April contracts have been concluded between the unions and the following companies, carrying the same scale and working conditions as last year: Hopper Paper Co., of Taylorville, Ill.; Sears-Roebuck Co., of Chicago; St. Croix Paper Co., of Woodland, Me.; Ontario Paper Co., of Thorold, Ont.; E. B. Eddy Co., of Hull, P. Q.; E. R. Booth Co., of Ottawa, Ont.; the Great Northern Paper Co., with mills at Millinocket, East Millinocket and Madison, Me.; the John R. Manning Co., of Troy and Green Island, N. Y.

Carthage Sulphite to Be Sold May 26

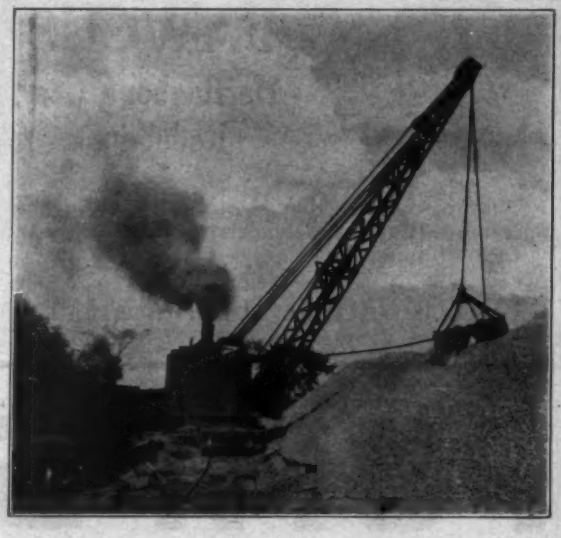
Federal Judge Frank Cooper has ordered that the plant and property of the Carthage Sulphite Pulp and Paper Co. be sold at public auction Tuesday, May 26. The sale will be in charge of Attorney Charles E. Norris, receiver for the company, and will be conducted at the court house in Watertown. The sale is ordered to satisfy a mortgage of $600,000 on the property. The case has been in federal courts for several months, the chief question being whether the company should be continued under the management of the receiver, or whether the property should be sold. Under the order of Judge Cooper, the highest bidder must deposit at least ten per cent of the purchase price at the time of the sale.

The sale of the plant will be made with a view of satisfying the claims of the bond holders, to secure whom a mortgage was executed to the United States Trust and Mortgage Co., of New York. This corporation had brought suit to foreclose the mortgage for the benefit of the bondholders and it was under the adjudication of this action that the disposal of the property was ordered by Judge Cooper.

The properties and assets of the concern were taken over by the receiver on Jan. 24, 1924, and the mill has been practically idle since that time. Whether the real property involved will be of sufficient value to meet these obligations is not known, but a valuable water power is included in the property.

Besides the mill and power there was held by the trustees as assets of the bankrupt concern some personal property including office equipment, raw material on hand and other property. It is understood that these are not involved in the sale order, and also that creditors, other than the bondholders, will not benefit from the same unless there is a surplus after the claims of the bondholders have been satisfied.

Other creditors of the company claim that fraud was employed in order to obtain credit. Attorney George E. Van Kennen of Ogdensburg, as special master in the bankruptcy proceedings, held that the Dexter Sulphite Pulp & Paper Co., of Dexter, and the Smallwood-Low Stone Company, of Steubenville, Ohio, were entitled to property which they seek to claim.



No More Costly Mistake Could Be Made Than to Buy a Locomotive Crane on Purely a Price Basis

AFTER a locomotive crane is installed and the routine of the plant or construction job adapted to it, every breakdown on the part of the crane means a slowing up or complete stopping of work on the whole operation. In the case of a crane bought because its price was low it won't take many serious tie-ups of this character to eat up the "saving" under the cost of the dependable "AMERICAN" Locomotive Crane.

The "AMERICAN" Locomotive Crane is the only crane that does not depend on a king-pin to tie the revolving deck to the car body. On "AMERICAN" Locomotive Cranes tipping strains are distributed around the 21-foot circumference of the interlocking roller paths instead of being concentrated in a king-pin a few inches in diameter.

Other locomotive cranes require a slip ring because some sort of "cushion" has to be provided against the shock of throwing in the positive clutch. The smooth, jerkless grip of "AMERICAN" expansive frictions renders such makeshifts unnecessary. The "AMERICAN" starts to slew smoothly and stops smoothly—and there is no guesswork about *where* it will stop.

These are only a few high spots of "AMERICAN" superiority. Before you buy a crane, let us tell you more about the "AMERICAN." You will be under no obligation if you don't buy. New Crane Catalog now ready. Write for your copy.

AMERICAN
HOIST & DERRICK CO.
Saint Paul, Minn.
New York, Chicago, Pittsburgh, Seattle, New Orleans

FAWCUS
Herringbone Gear Reductions

They increase production, save labor and decrease wastage on Calenders. Write for literature. Special Machinery—Couplings—Gears.

FAWCUS MACHINE CO., Pittsburgh, Pa.
2819 Smallman St.

Pickles' Patent Automatic Steam Regulator
FOR
Paper Making Machines

Which absolutely control the drying of the sheet. Installed on sixty days' trial

W. F. PICKLES **Buckland, Conn.**

PUMPS
INDUSTRIAL—AGRICULTURAL—MUNICIPAL—RESIDENTIAL
A Type for Every Service
THE GOULDS MANUFACTURING COMPANY
SENECA FALLS, N. Y.
GOULDS

Ticonderoga Machine Works
TICONDEROGA, N. Y., U. S. A.
MANUFACTURERS OF
WARREN IMPROVED CALENDER DOCTORS
With Flexible Blades, Universal Adjustment and Control (PATENTED)
WARREN IMPROVED PATENT DOUBLE DRUM WINDERS
Patent BALL VALVE Hydrant
Stock Circulating Systems *and*
other Paper Mill Specialties
SEND FOR OUR BULLETIN

THE JOHNSON FRICTION CLUTCH
As Used on the New Type V
Langston Paper Slotter

SINGLE CLUTCH WITH PULLEY

On this machine the Johnson Clutch on the cutter shaft speeds up the registering of the slotting heads and the feeds. Johnsons are giving splendid service on this paper slotter. Johnson construction and operation are particularly adapted to the needs of paper making machinery.

There must be good reason why the Samuel M. Langston Co. keep adding Johnson Clutches to type after type of their machines. They now use JOHNSONS ON FOUR DIFFERENT TYPES of paper machines. This is because they have used Johnsons for years and know how they respond to requirements. Let us advise you regarding what these clutches can do on your paper machines. Equip with Johnsons.

COURTESY: The Samuel M. Langston Co., Camden, N. J.

Johnsons are used in paper plants throughout America, and in foreign plants as far distant as Siam.

WRITE FOR CATALOG "P. I."

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

In the case of the Dexter Sulphite Co., the property involved consists of a quantity of sulphite pulp valued at $7,423.55, while in the case of the Smallwood company it is seven pulp stones valued at $1,950. The sale of the sulphite pulp was made on Nov. 20, 1923, and delivery was made a few days later. The company was insolvent at that time, it is stated, and closed the first week in December. A receiver was named a month later.

Leaves International Company

M. O. Wood, for 25 years in the service of the International Paper Co., and for the last 12 years manager of the Piercefield mill has resigned from the International company. Mr. wood is a graduate of Union college and first attracted the attention of the International company when he was engaged in surveying disputed boundary lines in the Adriondacks. He was engaged as surveyor for a time and later became resident engineer, at Otis, Me., and was later promoted to be manager of the Piercefield mill, going there in 1913. The mill and the village dependent upon it were in a very run down condition when Mr. Wood took charge. President Philip T. Dodge made Mr. Wood directly responsible to him.

Believing that better living conditions were needed, Mr. Wood made a number of recommendations which were approved. They made Piercefield a model industrial community. The village was practically rebuilt. Old shacks were torn down and well built houses replaced them. A modern school building was constructed, yards were graded and lawns made and proper sanitary measures were taken. During the war a fine community building was constructed. A small hospital was fitted up and a trained nurse was employed to look after the health of the community. Mr. Wood was always solicitous of the health and safety of the employees.

In addition to paying for the improvements in the village, the mill made a good profit and this condition continued until the strike in 1921. Even during the strike, the good will built up by Mr. Wood continued, and no damage was done to the company's property and no bodily harm was threatened when the places of the strikers were taken by new workmen. Piercefield had the reputation of being a "good place to work," and the mill was among the first to re-open after the strike. In addition to acting as superintendent of the mill, Mr. Wood interested himself in community affairs, serving as president of the board of education, as a member of the town board and as justice of the peace.

Mr. Wood has returned to his home in Herkimer, where he will take a long rest before taking other employment.

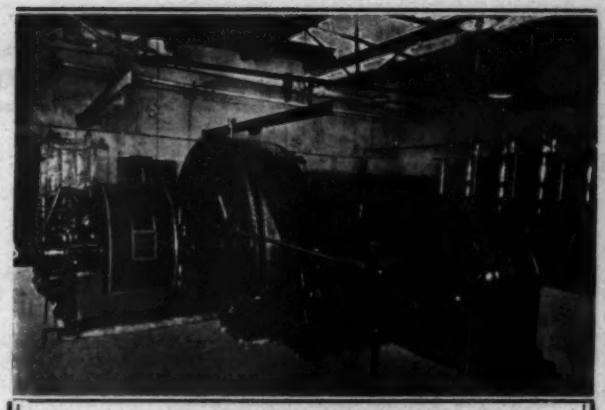
Shortly before their departure, a beautiful reception was given in honor of Mr. and Mrs. M. O. Wood. The Community building was crowded with friends, employees and co-workers, and dancing was enjoyed until a late hour. During the evening Prof. R. I. Banford, in behalf of the people of Piercefield, presented to Mr. Wood a very beautiful and costly diamond ring, and to Mrs. Wood a fine leather traveling case fitted with amber toilet articles.

Look Out for This Man

T. E. Lloyd, secretary of the Hinde & Dauch Paper Co., of Canada, Ltd., has reported to the police on this side of the line that note paper of the company has been forged in a plan to extract money from people in different parts of the United States. He reports that certain persons living in the United States who had patented articles and had them registered in the United States patent office had received letters purporting to come from the Hinde & Dauch company, offering them large sums of money for their patents.

The recipient of the letter was in each instance waited on by a clever appearing individual who said that he had been authorized to negotiate for the transfer of the patent. The man claimed to be a patent solicitor from Toronto and demanded a certain percentage of the amount involved as his commission. In several cases, it is reported that he was successful.

The New York World interests which control the pulp wood terminal at Ogdensburg and the DeGrasse Paper Company



300 hp. Gas engine driven Alternator
Engine pulley 114 in. diameter, 31 in. face
Alternator pulley 27 in. diameter, 27 in. face
Pulley centers 10 ft. 0 in.

THE LENIX* DRIVE

1. Reduced the pulley centers from 41 feet to 10 feet.
2. Permitted the installation of another unit in the same building.
3. Saved the cost of extending the building in order to accommodate the new unit.
4. Eliminated belt slippage and increased the life of the belt.
5. Increased the capacity of the unit about 25 per cent.
6. Saved approximately 62 feet of double leather belt 22 inches wide.

Each one of these six items has a real money value. The saving in belting alone was more than sufficient to pay for the Lenix.

The general manager of the power plant in which this Lenix is installed wrote us the following letter:

"We were able to shorten our belt centers approximately 31 feet; this has meant a great saving to us in room and permitted room for an additional unit. The drive has also been very helpful by eliminating belt slippage and belt troubles generally and in increasing the capacity of the unit about 25%. It has also increased the life of our belt and we are highly pleased with the operation of this drive from that standpoint as well as the saving of space."

The Lenix is not an idler. It is a "belt wrapper" scientifically applied to belt drives for the purpose of saving floor space, eliminating belt slippage and increasing the capacity of the drive.

Send for Booklet "Saving Slippage and Space."

F. L. SMIDTH & CO.

ENGINEERS

50 Church St., New York, N. Y.

*Registered

RHOADS

Long Lasting Belting

It pays to use leather belts

WE KNOW of one other Rhoads belt, put on in 1882; and of four other Rhoads belts that have been running for thirty-six years.

These belts belong to a period preceding present high-pressure production methods that now seem a business necessity. And on many of your modern drives, under modern conditions neither you nor we would expect belts to last thirty-five or forty years.

But of this you can be sure, Rhoads belts were never better nor more skillfully built than at present. Our research and testing laboratories, and our special tanning methods make this possible.

And our earnest desire to augment the Rhoads' reputation for good goods, reaching back over a continuous period of 223 years as leather tanners, is a stimulus in itself to produce best belts.

Rhoads Tannate Watershed Belts Can Save You Money

IT OUT-LASTED THE ENGINE

This Rhoads Belt installed 1882. An additional ply put on 1898. Engine dismantled 1923. Old belt still in good condition.

CARE OF BELTS

It is very important that a leather belt be kept pliable and elastic. For only in that condition can the belt fibers move easily, without break or strain. As soon as the belt begins to get dry and hard these fibers tend to break and your belt is then "wearing out."

Keep Rhoads Belts young by using on them

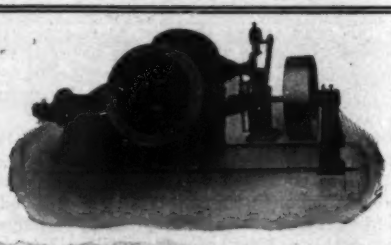
RHOADS LEATHER BELT PRESERVER

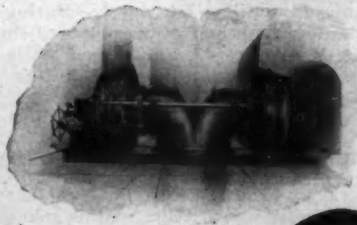
Good for other leather belts, too, if you have them.

J. E. RHOADS & SONS

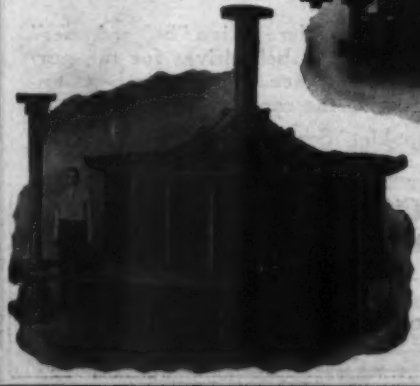
Philadelphia: 47 N. Sixth St.; New York: 112 Beekman St.; Chicago: 343 W. Randolph St.; Atlanta: 80 Forsyth St.
Factory and Tannery, Wilmington, Del.

Now!





There's no time like the present to install modern and efficient equipment for the development of water power. SMITH HYDRAULIC TURBINES will meet every conceivable water power requirement.



Our Engineering Department and the use of our Hydraulic Laboratory are at your service.

Write our Dept. "T" for Bulletin of Designs.

1925

S. MORGAN SMITH CO.

York, Penna.

at Pyrites, have asked the new Ogdensburg Feldspar Corporation to give assurance that the wood piled at the terminal will not be damaged by the dust from the stacks of the proposed feldspar plant operating on adjoining property. It is the contention of the paper interests that the dust from the feldspar settling on the wood, would damage the machinery when the logs were sent to the mill for manufacture. The Feldspar Corporation gave assurances that the refining process would be carried on in such a way that no damage would be done.

The employees of the St. Regis Paper Co., at Deferiet have organized a checker tournament. Thirty-two men are entered. The winner will be determined by elimination contests and will be presented with a three months paid up health and accident insurance policy.

The International Paper Co. earned $5.16 a share on common stock in 1924 after preferred dividends, in contrast with $11.59 a share in 1923. Net income declined to $2,532,656 from $3,809,540. Operating revenues were $7,815,504 compared with $8,074,577 in 1923.

Carlisle Mills' Report for 1924

The consolidated annual report covering 1924 operations of the St. Regis Paper Co. and the Hanna Paper Corporation, which jointly hold a controlling stock in the Power Corporation of New York, shows total receipts of $9,967,276 and net earnings of $1,710,518. After allowing $148,902 for interest and Federal income taxes and $506,817 for depreciations, there remained a balance for dividends and surplus of $1,054,798. Dividends amounting to $2 a share were paid during the year on the common stock. The statement shows that the common stockholders' equity in the companies Dec. 31, 1924, was $12,479,286.

The consolidated balance sheet as of Dec. 31, 1924, shows total current and working assets of $4,675,543, compared with current liabilities of $897,216. Investments include holdings in the Power Corporation of New York, St. Regis Paper Co., of Canada, Ltd., etc., carried at $5,948,049. Reserves include $2,847,557 for depreciation of the plant property, $805,808 for contingencies, $65,000 for 1924 Federal income tax and $57,252 for other reserves.

Ohio News

May 1, 1925.

Meeting of Miami Superintendents

Two Middletown members of the Miami Valley Division of the American Pulp and Paper Mill Superintendents' Association, Tom Harvey, general manager of the Gardner-Harvey Co., and B. M. Bishop, superintendent of that concern, attended the April meeting of the division, Saturday, April 25, in Dayton. The A. A. Simonds-Dayton Co., of Dayton, extended the courtesy of the dinner at the Engineers' Club to the paper men from all sections of the valley in attendance.

Moving pictures of the holdings of the Champion Coated Paper Co., of Hamilton, proved the interesting feature of the hours following the dinner. The May meeting will be held in Middletown.

Cincinnati manufacturers and business men were guests of the Champion Coated Paper Co., of Hamilton, Tuesday, April 28. A tour of the Hamilton plant, showing the way the Champions do it, and a noon luncheon were the outstanding features of the day. The Cincinnati aggregation numbered nearly one hundred.

Manufacturers' Association Elects New Officers

R. D. Bertschy, president of the Miamisburg Paper Co., and J. G. Kline, secretary of the same company, were elected president and secretary-treasurer, respectively, of the Miami Valley Paper Manufacturers' Association at the annual dinner of that Association at the Hotel Manchester, Middletown, April 30.

In connection with the election and dinner, W. W. Freeman,

GARDCO
A PAINT WITH A PURPOSE
Protection of metals regardless of conditions
GARDCO PAINT PRODUCTS COMPANY
53 WEST JACKSON BLVD., CHICAGO
Distributors in Principal Cities
PAINTS

MAGIC BOILER PRESERVATIVE
"The Pioneer Boiler Treatment"
Positively removes and prevents scale, stops minor leaks, pitting and corrosion
GARRATT-CALLAHAN CO.
27 South Clinton Street, Chicago
148-156 Spear St. San Francisco
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MAGIC ESTABLISHED 1904

Steel Plate Construction
Steel Storage Tanks, Blast Furnaces, Gas Holders
Steel River Barges and Plate Work of all Kinds
Steel Transmission Towers
RITER-CONLEY COMPANY
General Offices, Pittsburgh, Pa.

HAMLER BOILER AND TANK CO.
FABRICATORS OF STEEL PLATE FOR OVER SIXTY YEARS
SEND DRAWINGS AND SPECIFICATIONS FOR PRICES
CHICAGO-MINNEAPOLIS-ST. LOUIS-NEW YORK

RESILIENT RUBBER ROLLS

THAT ARE SPRINGY BUT NOT SOFT
GIVE FELT ECONOMY AND
STAND UP IN SERVICE

Made By

STOWE & WOODWARD COMPANY

The Rubber Roll Makers NEWTON UPPER FALLS, MASSACHUSETTS

THE WATERBURY FELT CO.
SKANEATELES FALLS
New York

FELTS and JACKETS

Top and Bottom Wet Felts for board machines, with all the qualities requisite to insure long life and continuous production.

They Satisfy

LOCKPORT Felts

EXCLUSIVE MAKERS OF

Paper Makers' Felts

Have You Run Them?
If Not, Why Not?

Are You Interested in Accurate Running Felts?

Give Us a Trial
Get Authentic Information
Ask the Men Who Run Them

Yours for service

LOCKPORT FELT CO., Newfane, N. Y.

Fitchburg Duck Mills

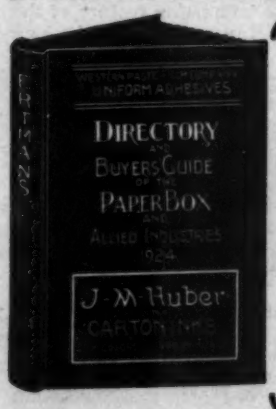
ESTABLISHED 1844
54 Duck Mill Road
FITCHBURG, MASS.
MANUFACTURERS OF

STANDARD AND MULTIPLE PLY

DRYER FELTS

English Weave in Two, Three, Four, Five and Six Ply—60 Inches to 176 Inches in Width

Fine Faced Felts for Fine Papers. Absolutely no felt marks in paper. TRIUNE Three Ply Felts for Coarse Papers.



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PAPER BOX INDUSTRY

GET THIS BOOK

For Particulars Address

RAVENSWOOD PUB. COMPANY

115 Washington Ave. No. MINNEAPOLIS

president of the Union Gas and Electric Co., spoke on "Electric Power," consisting of a comparison of utility business and manufacturing.

The main point brought out by Freeman was that the utility business requires new capital, continuously, which has to come from the public through the selling of securities. This is due to limitations in profits allowed by law to charge for services. Private manufacturing companies, though, can build up their capital account from accumulating profits.

Thirty-five prominent paper manufacturers of the Miami Valley were present. Those attending from Middletown were: Tom Harvey, George Harvey, E. C. Gardner, J. C. Leach, Charles Aull, Donald Driscoll, M. A. Thomas, J. J. Hallowell and John Calder.

The meeting was held in Middletown because it is nearest to being the center of the Miami Valley and gives the persons in different cities less trouble in attending the meetings.

New York City News

New York, May 1, 1925.

I. P. Increases Capital

The International Paper Co. has filed notice with the Secretary of State at Albany, N. Y., of an increase in capital stock from $45,000,000 to $125,000,000.

At a recent meeting John R. Macomber, Lansing P. Reed, Floyd G. Simons, Herman Elsas and Owen Shepherd were elected new directors of the company.

Paper Man to Marry Princess

An announcement which created a great deal of interest in paper trade circles here is of the engagement of Bruce Smith, son of Mr. and Mrs. Thomas Floyd Smith, of Louisville, Ky., to Princess Bertha, daughter of Prince and Princess Michael Cantacuzene, of Washington, D. C., and New York City.

Young Mr. Smith is with his father's firm, the Louisville Paper Co., in Louisville, one of the largest paper jobbing concerns in the South. He is a graduate of the Yale Scientific School, where he studied paper chemistry. His father is a former president of the National Paper Trade Association. The bride-to-be is a great-granddaughter of President Grant, her mother being formerly Miss Julia Dent Grant, whose marriage to the Russian nobleman took place in 1899.

The Golf Committee of the Salesmen's Association of the Paper Industry, of which Edwin D. Peck is chairman, is making arrangements for a golf tournament to be held some time during the coming summer. Details have not been worked out as yet, but there will be play for a handsome cup in each of four divisions. The tournament will be over the links of some country club near New York, and the interest already manifested by members insures a large participation in the event.

Joseph L. Fearing, manager of the department of sales of the International Paper Co., with head offices in this city, sailed on April 4 on the steamer Homeric for a month's visit in Europe, where he will study trade conditions. Mr. Fearing will visit London, Paris and other leading cities on the other side of the Atlantic.

Emmet Hay Naylor, secretary of the Writing, Cover and Tissue Paper Manufacturers' Association, sailed from Boston on the steamer Martha Washington April 15 for a trip to Europe. He will journey to Italy first and then will go to France and England, afterward going to Brussels, Belgium, in time to attend the convention of the International Chamber of Commerce to be held there June 21 to 28. Mr. Naylor is a delegate from the American Paper and Pulp Association to this convention. He will return home following the convention.

A petition in bankruptcy was filed April 17 against the Dragon Paper Manufacturing Co., Inc., manufacturing wax paper and paper specialties at 484 Van Alst street, Brooklyn, by Lewis Z. Gottheimer, creditor for $10,430; David Gottheim-

MARION
Dolly Trucks
Move Your Stock Easily

You can move the heaviest rolls easily, safely and quickly! Marion Dolly Trucks save time and material. They cost no more than ordinary Dollys, but embody many new and exclusive advantages. Built low and with sloping skids; easy to load and unload; frame curved to hold rolls of paper and barrels firmly in place.

Wheels on center axle are larger than those on ends, permitting tilting and making Marion Dollys easy to guide anywhere.

Simple and light enough to be carried anywhere needed, yet durable and practically indestructible. Will last for years. Frame of Marion certified malleable. Steel wheels with tool steel roller bearings.

Marion Dollys "stay put" while being loaded; made so that they don't crawl away from you. Heavy rolls can be loaded or unloaded without jarring, tearing or bursting.

Your savings in stock and manpower will make it cheaper for you to own Marion Dollys than to try to skimp along without them. Get yours NOW!

Marion Tool Works, Inc.
Marion, Indiana.

TEAR OFF AND MAIL

Memo. Send complete information, prices and special 10-day trial offer to name and address in margin.

Wanted: Chief engineer for paper mill located in the middle west near Chicago. Must have thorough working knowledge of steam and maintenance in box board mill. State age, nationality, education, and complete experience, of positions occupied and with whom, by years. Give reference and salary expected. Address Box 72, c/o The Paper Industry.

"Wanted for large papermill in Province Quebec engineering-draftsman with thoroughly practical experience in design, operation and maintenance of modern newsprint mills; good opportunity for man with ability. Apply Box No. 73, The Paper Industry."

FOR SALE: Slightly Used Beaters.

2—1200 Lb. Iron Tub Beating Engines.
1—2000 Lb. Allen Breaker Beater (nearly new).
1—1200 Lb. Breaker Beater. (Can be made into a regular beating engine.) Will sell the above "as is" or factory rebuilt. Also:
3—800 Beating Engines, rebuilt with new wooden tubs.

THE NOBLE & WOOD MACHINE CO., Hoosick Falls, N. Y.

Robins Conveying Systems

FOR HANDLING BULK MATERIALS

Write for Handbook of Conveyor Practice

ROBINS CONVEYING BELT COMPANY

New York Chicago Pittsburgh Boston

Paper Machinery For Sale

One FOURDRINIER TISSUE PAPER MACHINE—takes wire 126".
Two presses; nine dryers 48" x 118"; calender, reel, drum winder. Self-contained Marshal drive.
One PUSEY & JONES FOURDRINIER PART—takes wire 126" x 60 ft. New Century shake; Millspaugh suction roll and Connersville pumps.
Moore & White four drum winder 118"; 120"; 96"; 72".
One 86" stack machine calenders; bottom roll 24" diameter; three 12"; top roll, 22".
One 82" stack machine calenders; nine rolls.
Two 72" stack machine calenders.
Four 66" nine roll Holyoke super calenders.
Seventeen dryers 36" x 84".
Twenty-one dryers 36" x 66".
One 84" Moore & White late type sheet cutter.
Four 60" Hamblet sheet cutters with Moore & White layboys.
Four Jones beaters 66" x 57".
Two Noble & Wood Monarch Jordans.
One Noble & Wood Pony Monarch Jordan.
One Jones Wagg Majestic Jordan.

For sale by

FRANK H. DAVIS CO.

175 Richdale Ave. Cambridge, Mass.

MANITOWOC

BUILDS TO GIVE

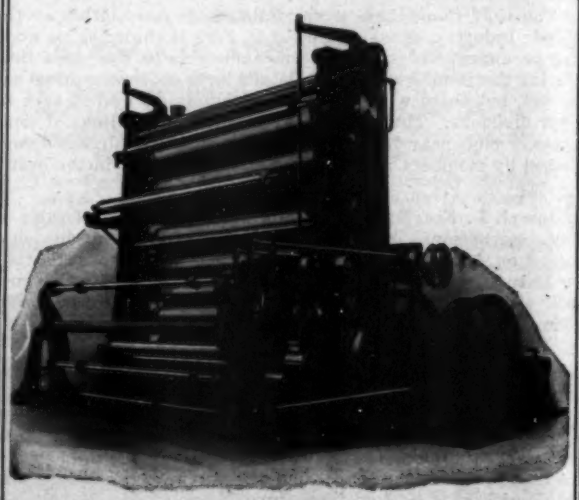
SERVICE

Digesters
Diffusers
Incinerators
Disc Evaporators
Blow Pipes
Causticizing Tanks
Dissolving Tanks
Barking Drums
Bleach and Clay Mixers
Miscl. and Special Mach.

What have you that we can quote on?

Manitowoc Engineering Works
MANITOWOC, WIS.

NORWOOD SUPER CALENDERS



WE ARE SPECIALISTS IN

Paper Finishing Machinery

NORWOOD ENGINEERING CO.
FLORENCE, MASS., U. S. A.

er, $315, and Max Bleyer, $583. Judge Campbell later appointed Nicholas Selvaggi receiver, in bond of $5,000.

At the annual meeting recently of the Union Bag and Paper Co., Alexander G. Calder was elected a member of the board of directors, succeeding C. B. Jaqua, resigned.

Katzenstein & Keene, Inc., importers of papermaking rags, have moved their offices from 50 Church street, New York, to their warehouse at 46 Harrison street, Hoboken, N. J.

Carlton G. Winans

Carlton G. Winans, head of the C. G. Winans Co., paper merchants and importers of Newark, N. J., died at his home in that city on March 26 after a brief illness. Mr. Winans had long been prominent in paper trade circles.

The Manhattan Paper Co., Inc., has removed from 470 Broome street to larger quarters at 127-129 Bleecker street, New York. David L. Cohen, who founded the Manhattan Paper Co., has severed his connection with the company and is now in business at 43 Greene street under the name of the Hope Paper Co.

At a recent meeting of the Grand Lake Co., of New York, the following officers were elected: D. D. Bradish, president; Owen Shepherd, vice-president and treasurer; A. L. Moore, secretary and sales manager, and H. R. Weaver, assistant secretary and treasurer.

James Rosenberg, formerly president of the American Woodpulp Corporation, of this city, and more recently with M. Gottesman & Co., is now with the E. J. Keller Co., Inc., importers of wood pulp and other papermakers' supplies, of 200 Fifth avenue, New York.

Louis T. Stevenson, representative of the Mountain Mill Paper Co. and the Rollstone Paper Co., has moved his offices to 441 Lexington avenue, New York, telephone Vanderbilt 0433.

8" Horizontally Split Casing Single Suction Belted Pump for Handling Heavy Stock

Built in sizes ranging from 2" to 18". 42 years designing and building centrifugal pumps for all conditions and service. Our engineering staff is ever at your service.
Please submit your specifications.

LAWRENCE MACHINE COMPANY
LAWRENCE, MASS.

Manufacturer of "Lawrence" Pump, Centrifugal Pumping Machinery, Vertical Steam Engines, Contractors for Special Machinery

THE MATTER OF BALANCE

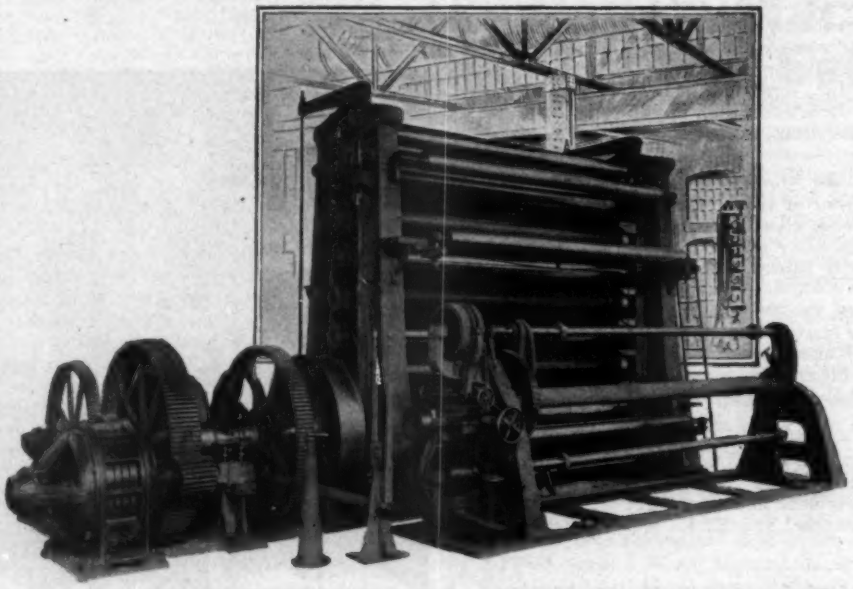
¶ In any high speed roll-winder, the winding drums revolve at a surface speed which is often as much as 2000 feet per minute. If the drums are not properly balanced, the bearings will quickly wear out and the effective life of the machine will be shortened through the vibration which ordinary drums will cause. This is an important fact which is sometimes ignored by both builders and buyers of roll-winding equipment.

¶ The winding drums of CAMACHINE high speed mill type winders are all properly balanced. They are balanced dynamically — balanced while revolving in a specially designed balancing machine — balanced so that the center of gravity coincides with the center of rotation.

¶ In actual day-after-day practical service in the mill, dynamic balance proves its worth in the reduction of maintenance charges and in the elimination of shutdowns for repairs.

Shall we tell you how CAMACHINES can serve you in the mill? We will be able to send you a definite proposal if you will write us concerning your problems in detail.

Cameron Machine Company
Sixty-one Poplar Street
Brooklyn, New York, U.S.A.
(Builders of CAMACHINES)



These massive, slow moving gears

—need a clinging lubricant that forms and holds the "film of protection"

IN your mill, there are many gears that need lubrication. Most of them are ponderous and slow-moving; and the *quality* of the lubricant is more important than the *quantity*.

It is obvious that the lubricant you use must not channel or fly off, but cling tenaciously to the gear teeth and form a tough, sturdy "film of protection" at all times.

The "film of protection"

For gears, opened and enclosed, the technologists of the Tide Water Engineering Bureau have perfected two lubricants—Tycol Gear Compound and Tycol Gear Coating Soft—that give the perfect "film of protection". Both are semi-fibrous, high quality greases. In use, they cling tenaciously to the gear teeth—but do not channel.

They are also extremely economical—a little goes a long way. Even after long periods of service, their lubricating value remains unimpaired, and exposure to air will not cause oxidation.

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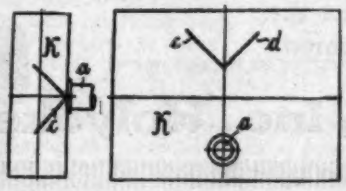
Technical Developments in the Paper Industry

Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Variation of Paper Tension in the Width of the Web

IT IS well known that very often the tension on a manufactured paper varies considerably across the width of the web. There is no question but that this is a disadvantage from many standpoints. In the first place, irregular tension on the paper as it is being manufactured has a great influence on the mechanical strength of the paper. It is not at all rare that the tearing length of samples of paper, which have been cut out of the web at different points, will vary more than one thousand meters and the paper maker knows well that the purchaser of the paper will often make claims on him for imperfect product and give him considerable trouble. A study of the various causes which bring about this variation in the tension on the paper during its manufacture has recently been made and published in the *Papier Fabrikant*.



For example, the following may be mentioned as important factors which control the regularity of the tension under which the paper is manufactured. There is the imperfect distribution of the paper pulp over the wire of the paper making machine, the wire being in a position which is not strictly horizontal. A poorly controlled shaking device will also produce uneven tension, as will cylinder rolls which are crowned too much. All these influences will result in different tension on the paper throughout its width.

In the original paper, the author examines each one of these points and as far as the improper distribution of pulp across the width of the wire is concerned, he has been able to design a contrivance which is claimed to give good results. The new process consists in placing a baffle at the point in the stuff chest where the pulp first enters. This baffle disturbs the free progress of the pulp and directs it where it is desired to send it.

Suppose, for example, the paper web was too thin on the edges and it was not possible to remedy this fault by any other means, then, as is seen in the figure, if an angle made of wood, shown at (c), is placed opposite the pipe which leads the pulp and water mixture directly into the stuff chest, it will be found that the greater part of the fibers are directed towards the edges of the wire with the result that the paper builds up thicker at those points. Moreover, the baffle (c) may be placed at any other point in the stuff chest, and most often it is found right below the inlet opening to the box. The dimensions of the baffle must be determined by trial so as to see what size will give the best results.

Hot Grinding of Pulp

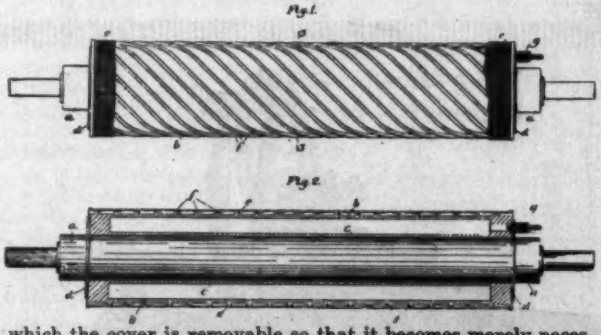
THE modern tendency is the supersession of high power, hydraulic, multipress grinders by continuous pressure mills. In both cases, the horsepower per hundred pounds of the pulp decreases as the pressure is increased. If, at the same time, the quantity of spraying water is reduced, the heat generated in the grinding assists the disintegration of the wood tissues, with superior economic results and improved quality of pulp, so that a sharper stone may be employed. These principles are carried to their limit in the case of continuous pressure grinders, which are constructed with a much larger grinding surface than is possible with the multi-press grinders.

Thus, with the grinders with hydraulic presses, the maximum temperature that can be obtained under practical conditions in the pulp is approximately 65 degrees C, but with the continuous presses, working results can be secured at a temperature of 75 degrees C and the stones may be considerably sharper. Moreover, in comparative trials, the multipress grinders began to show signs of "dead-grinding" of the pulp when forced above a temperature of 57 degrees C, and above that temperature the strength of the pulp showed a diminution from the maximum, whereas the continuous press grinder gave stronger pulps, increasing in strength and useful fineness right up to the maximum temperature of 75 degrees C.

For further details see Zellstoff und Papier, volume 4, pages 311 to 318.

Dandy Rolls

AS IS well known, dandy rolls have to be replaced from time to time in accordance with any particular watermark or the like which they are designed to impress upon the paper pulp. To obviate the expense which the papermaker thus has to bear of holding a considerable number of dandy rolls in stock, attempts have been made to provide a roll in



which the cover is removable so that it becomes merely necessary to change the cover instead of the complete roll.

An invention which is patented in Great Britain by T. J. Marshall & Co. has for its object a novel construction of dandy roll which permits of this removal and replacement of the cover, being effected conveniently and with facility by the papermaker. To this end, according to the invention, the body of the roll is formed as an inflatable cylinder which is designed to be inflated with air or any other fluid and which is suitably secured upon the roll spindle and can be inflated and deflated through a valve placed in a convenient position. The cover is designed to be passed over the deflated body which is then inflated to a sufficient degree to cause the cover to be held and retained in position and to provide the resistance necessary in the use of the roll.

Any suitable construction of inflatable cylinder, either single or multi-chambered, may be made use of and its outer surface may be either plain or ribbed, the india rubber or other inflatable bag or cylinder being attached to the roll spindle by any convenient means. For example, the cylinder

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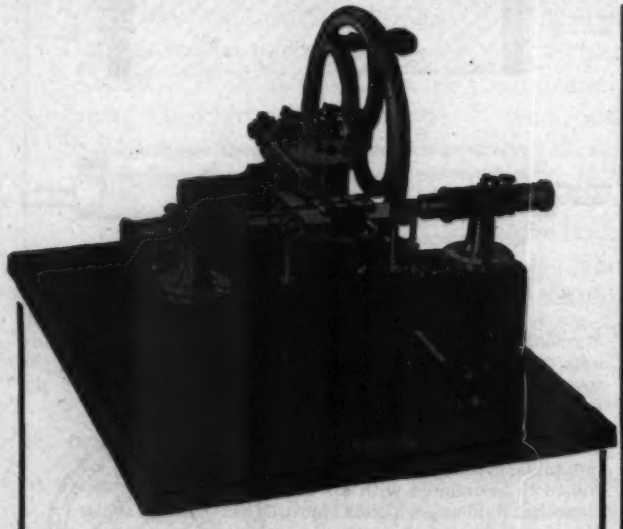

Poller Folding Endurance Tester

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may be furnished with an axial tube through which the spindle is designed to pass, that a completely closed chamber is provided and the whole may be secured to the spindle by flanges.

In the drawings (a) is the spindle on which the dandy roll is mounted and by which it is rotated and (b) is the body of the roll of hollow cylindrical form made of rubber or other similar elastic material, the inner portion of the body being formed by a tube (c) which fits on the spindle between flanges or collars (d) which may be secured to the spindle by soldering or in any other suitable manner. (e) is the wire gauze which covers the dandy roll, the cover fitting around helical ribs (f) on the body (b) so as to be well supported over the whole of its length.

Meter for Bleach Liquor

WHERE bleach liquor is used, the problem of finding a suitable meter for it is often confronted. The sketch shows a simple device which records the amount of liquor that is taken from a tank and which can be easily made. A bottle float is attached to one end of a cord with a weight on the other end. The cord runs over a pulley with a revolution of counter attached. This is indicated in the sketch by the arrow. One revolution of the pulley corresponds to a distance on the tank the length of the circumference of the pulley. Knowing the diameter of the tank, the number of gallons corresponding to one revolution can be calculated. The counter records only as the tank is emptied. In this matter, an accurate check is obtained on the amount of liquor handled by the tank, providing the discharge is closed while the tank is being filled.—The World's Paper Trade Review, March 6, 1925.

Pulp from Resinous Wood

THE process, which is patented in French Patent Number 584,828, has for its purpose the manufacture of a paper pulp from resinous wood so that either a chemical or a mechanical pulp may be thus obtained.

The process consists in placing the wood in a closed vessel, creating a vacuum in the apparatus and injecting a suitable solvent under pressure. For this purpose it is possible to employ ethyl alcohol, carbon disulphide, benzol, acetone, ether, turpenine, etc., in the presence of either gaseous or liquid ammonia. Thereafter, the wood is washed with an oxygenated solution and allowed to drain thoroughly. Evaporation of the liquors that are obtained in this manner allows the recovery of the solvents employed as well as numerous interesting by-products. The wood is removed and stored until needed for manufacturing purposes.

The wood that is obtained in this manner can be manufactured into mechanical pulp by the ordinary methods. It can also be made into chemical pulp by the soda, sulphate or sulphite process. In order to obtain a bleached mechanical pulp the operation is changed so that after treatment with solvents and ammonia gas the wood is subjected to the action of a liquor containing chlorine. Then the rest of the process is proceeded with in the ordinary manner.

Mitscherlich Test in Sulphite Pulp Manufacture

IN THE Mitscherlich test, ammonia is added to a sample of the liquor that is withdrawn from the digester and, according to the volume of the precipitate, the attendant judges the degree of digestion and whether the process may be continued at a high temperature or should be near completion. The ammonia precipitates chiefly calcium sulphite and thus the amount of precipitate is a measure of the calcium bisulphite that still exists in the liquor, together with the amount of free sulphur dioxide insofar as this is not in excess of the calcium in combination with the other acids in the form of more soluble salts.

Under practical conditions of taking the sample by blowing off a small quantity of the liquor from the digester into an open vessel, the sample loses nearly all its free sulphur dioxide. The drawing of the sample must therefore be done under very carefully regulated conditions of an empirical nature. Whereas a liquor which is blown out quickly in the ordinary manner was found to contain 0.74 per cent of sulphur dioxide, a sample which was taken at the same time slowly, drop by drop, contained only 0.54 per cent.

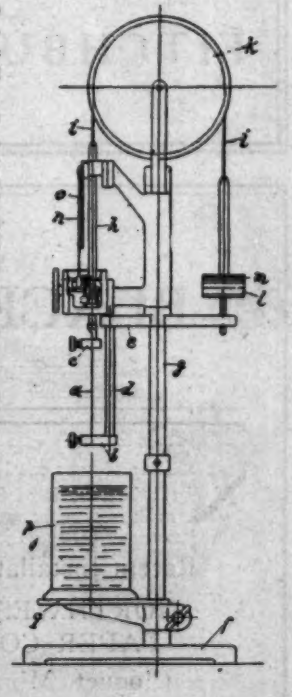
The strong acids that are produced during the digestion process, for example sulphuric acid, lignosulphonic acids, as well as the weaker acids, such as acetic and formic acids, displace sulphur dioxide from its calcium combination and therefor influence the quantity of ammonia precipitate by expulsion of sulphur dioxide more or less completely during the taking of the sample. A small precipitate with ammonia therefore indicates a high concentration of hydrogen ions and suggests caution in continuing the digestion at an elevated temperature. The practical method of judging the quantity of ammonia precipitate by the volume which it occupies is also liable to give deceptive results. The specific gravity of the precipitate increases as digestion advances, and for chemical control the titration of the sulphur dioxide in the same is the only correct procedure.

For further details see Papier Fabrikant, volume 22, pages 613 to 617.

Effect of Moisture on Size of Paper Sheet

IN ORDER to be able to determine in an exact manner the behavior of paper, particularly of paper that is intended for printing in colors by the multiple printing process, when the percentage of moisture in the paper varies, and in order to be able, therefore, to measure the stretch that takes place in paper on moistening and the contraction that takes place in it on drying, an apparatus has been designed which is patented in German Patent No. 400,983.

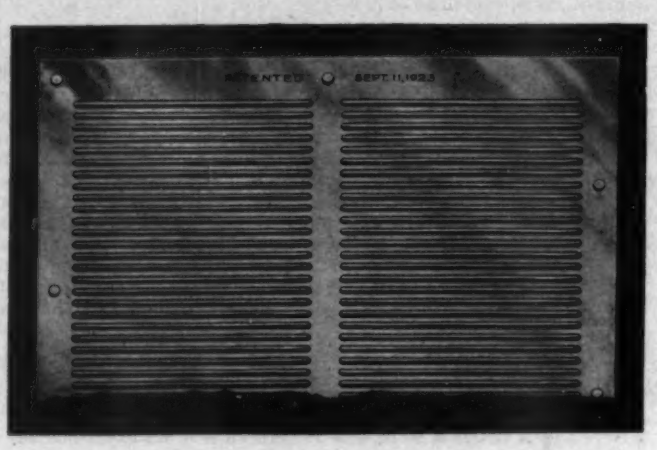
This instrument is very accurate and will record the changes in the surface of the paper sheet when it is allowed to dip into water or is placed in a moist atmosphere and also will indicate the differences that are induced in it when it is dried.



The apparatus is based on the principle that a strip of paper, fastened at both ends, is moistened and dried, and the changes that take place in the strip of paper held thus under tension are recorded by means of suitable recording devices so that it is immediately possible to tell what is happening in the paper strip. Thus, in the figure, the paper strip is shown at (a). This strip is held between two clamps (b) and (c). The clamp (b) is fastened to the lower end of the rod (d), the upper end of which is connected with a cross-arm (e), which is itself fastened to the post (g) which carries the apparatus. The clamp (c) is connected to the lower end of a rod (h) which is provided with a thread (i) at the upper end. This thread passes over the disc (k) which is fastened to the post (g). A weight (l) is fastened to the other end of the thread (i), and this weight may be increased or diminished at will by removing or adding weights (m). The movements of the rod (h) are translated by means of a suitable arrangement of levers, so that they may easily be read off an indicator (n) which moves over a scale (o).

The length of the rod (g) is such that the strip of paper which is fastened between the clamps (b) and (c) is constantly made to dip into a water container (p), which is fastened to a small plate (q). The latter may be moved up and down along the upright post (g) and fixed at any position by means of set-screws.

When the paper strip (a) is located within the container (p), which is filled with water, then under the effect of the weight (l), the thread (i) follows the action of the change in the



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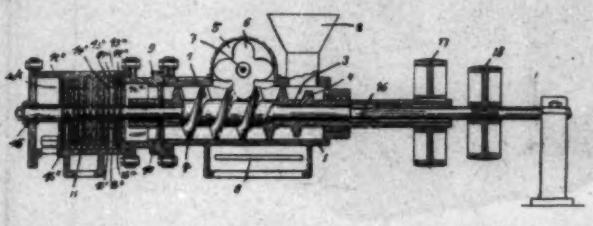
length of the paper strip (a), which is brought about by the absorption of the water, with the result that the strip of paper is always maintained under tension. The displacement of the clamp (c) is read off the scale.

Continues Pulp Making Process

THE raw paper stock in the continuous pulp making process is fed in an uninterrupted stream so as to come in contact with a mass of digestion liquor, and then after impregnation has taken place, the mixture is led through a beating apparatus and then brought into contact a second time with another mass of digestion liquor which finishes the treatment of the raw stock.



The apparatus which is employed and which is patented in German Patent No. 407,832, is shown herewith. It consists of a horizontal cylinder (1), over an end of which a funnel feeding device (2) is placed. The raw paper stock is fed constantly to the machine through this funnel. A shaft (3) runs through this cylinder, and this shaft is provided with a screw conveyor (4). This device serves to move forward the stock as it enters through the funnel (2). A portion of the screw conveyor is made in such a fashion that it exerts a cutting action on the stock in combination with the walls of the cylinder so that the large pieces of stock are cut up.

A dome-shaped affair is seen at (6), and a gear wheel (6) is placed in this space and is arranged so that it can rotate on its free axis and mesh in with the screw conveyor (4). This serves to prevent the stock from being forced backward in the wrong direction. It is also possible to heat the cylinder (1) by means of the firing device seen at (8). The dimensions of the cylinder and of the screw conveyor are such that the paper stock, when it reaches the end of the cylinder (1), is completely impregnated with the digestion liquor. In the case of all kinds of paper stock, with the exception of wood, the impregnation takes no more than thirty minutes.

When the paper stock emerges from the cylinder (1), it is still not properly disintegrated. It is then passed through the cutting device (10) which shreds the material. The beating device consists of the cylinder (11) in which there are arranged a number of solid separating walls (12a), (12b), etc., with the result that the cylinder is divided up into a number of sectional chambers (13a), (13b), etc. The separating walls are provided with openings such as (14a), (14b), etc. These openings are of decreasing width. A number of stirring arms (15a), (15b), etc., run in these sectional chambers. These are fastened to the shaft which runs through the center of the cylinder. The speed of the shafts (3) and (16) are arranged so that the arms (15) move at a greater speed than the conveying screw (4).

When the paper stock emerges from the cylinder (11), it is sent to a number of filter presses where the digestion liquor is removed. For details see German Patent No. 407,832.

Making Pulp by the Fournier Process

THIS process depends on the fine disintegration of the paper stock before it is treated with the digestion liquors. The finer the subdivision of the particles of the paper stock, the more surface will be exposed to the action of these liquors, with the result that digestion will be accomplished at a much greater rate and, furthermore, the action of the liquors will be more complete. The operation of digestion will of course be considerably shortened and simplified. In fact it will then be possible to carry out the digestion in the open air and not under pressure in a closed vessel.

Tests which were made for the purpose of comparing the operation of this process with those usually employed showed that the time spent in the cooking of the paper stock in the new process was only thirty minutes, while three hours were necessary for complete digestion in the others. The yield of paper pulp did not differ any more than two per cent.

The inventor of the process was able to construct an apparatus which did not injure the fibers, while it separated them and removed the incrustating impurities. This was accomplished by making the fibers rub up against each other while they were being digested.

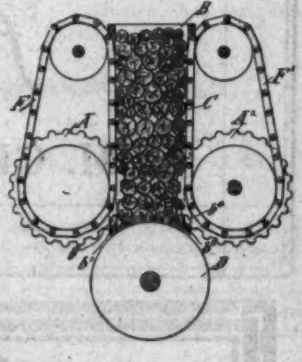
This process, which is particularly well adapted for the working up of straw stock, is claimed to give very good results. For further details the reader is referred to Le Papier, February, 1925, pages 209 to 210.

Making Slack Sized Paper

THE process of treating paper, which is patented in United States Patent, No. 1,532,579, has for its purpose the manufacture of a slack sized paper. The paper fibers are rendered more astringent, which consists in bringing them into contact either before or during the paper-making process with an aqueous solution of calcium sulphate in which there is more calcium sulphate than in natural mill water, but not enough to act as a filler for the paper.

Continuous Feed of Wood to Grinders

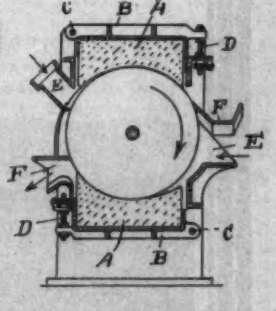
THE illustration shows an apparatus for feeding wood to mechanical wood pulp grinders in a continuous stream. The apparatus consists of a hopper or magazine which is indicated as (B) in the figure. On either side of the hopper there is an endless chain conveying device which serves to feed the wood to the stone in a continuous fashion. The chains are provided with projections which are spaced at equal distances on them and which take hold of the wood logs and cause them to be pressed against the surface of the grindstone. The apparatus is patented in United States Patent, No. 1,532,946.



Wood Pulp Refiner

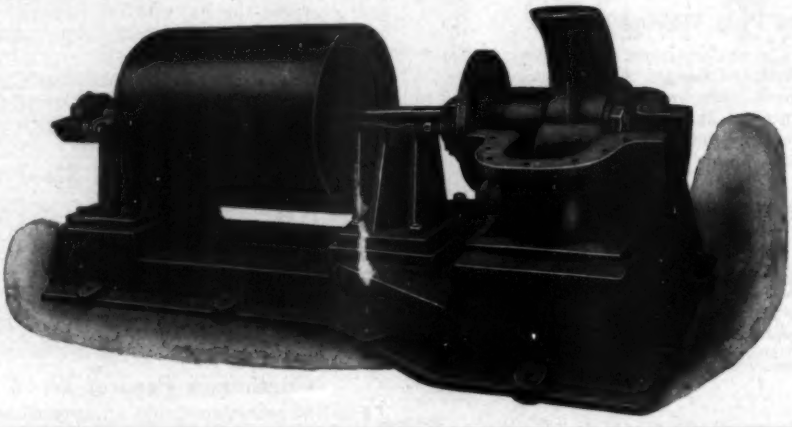
A WOOD pulp refiner, which is seen in the accompanying illustration, is described in the World's Paper Trade Review, March 27, 1925, p. 1058.

The main feature of the apparatus is the arrangement for mounting the bed stone or stones and it is particularly adapted for refiners with vertical axes. The stones are mounted on a pivot which is located on the inlet side, so that the edge of the bedstone at the inlet lies outside the connecting line between the axis of the refining stone and the pivot of the bedstone.



The arrangement which is shown in the sketch represents a refiner with a horizontal axis, the bedding of which consists of two stones, one over and one below the rotating gring stone.

The bedstones (A) are placed in frames (B) supported on one side by trunnions (C) and on the opposite side in the usual manner by screws (D). (E) are inlets and (f) the outlets for the pulp. The bearings for the trunnions (C) should be vertically adjustable so that they may be adjusted in accordance with the wear of the stones. It is said that in refiners which are constructed in this manner, the rotating stone will exert a pull on the bedstone in the direction from its trunnions. The screws for the adjustment will therefore be exposed to lateral stress and vibrations as is the case in refiners the bedstones of which are supported with four screws. The increasing pressure between the stones towards the outlet and the fact that the inlet space is widened by tightening the screws combine to increase the efficiency of the refiner.



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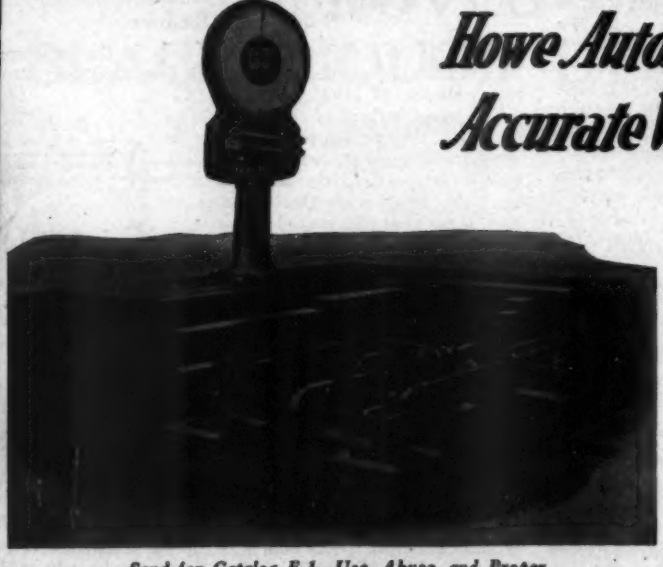

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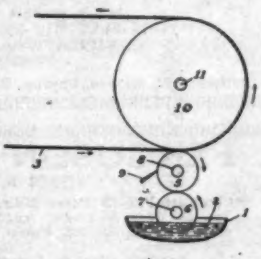
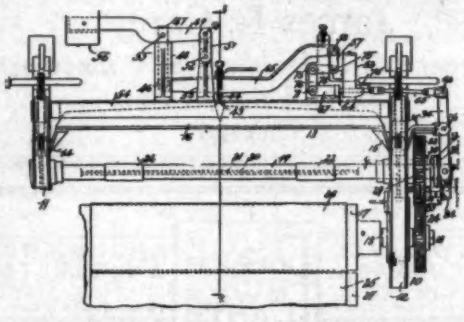
Configured Paper

UNITED STATES Patent, No. 1,532,712 is concerned with a process for the manufacture of configured paper. The sheet of paper that is produced by this process is marked with a visible configuration immediately without light passing through. This is accomplished by treating the paper which is seen in the accompanying figure as (3) with a liquid containing mineral oil mixed with rosin. This mixture is contained in the bath (1) and transferred from the bath to the paper by means of the rollers (5) and (6).



Severing Mechanism for Wet Paper Machines

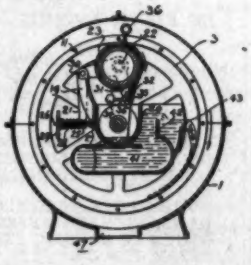
THIS device consists of a paper feed belt, a guide roll for the belt which acts in conjunction with a make-up roll, a



slide frame on which the make-up roll and the rotary cutter are mounted and around which they can be rotated. A mechanism is also provided which is actuated by the movement of the slide frame away from the guide roll, and this automatically operates the cutter to sever the paper on the make-up roll. The apparatus is seen in the accompanying illustration and is patented in United States Patent, No. 1,532,117.

Paper Making Machine

THE illustration shows a type of paper-making machine which is patented in United States Patent, No. 1,531,482.



The machine in question is well adapted for handling dilute paper stocks or other material which is suspended in a liquid. A screen drum is provided which develops centrifugal force and the paper web which is formed on the surface of the drum is removed.

Paper for Electrical Purposes

THE MANUFACTURE of paper for electrical purposes is the subject of a recent article which appeared in Der Papierfabrikant. A number of papers were examined from the standpoint of the special properties that they must possess when used for electrical purposes. A study was made to determine the effect of humidity in the paper, its thickness, its specific weight on its electrical capacity and resistance. The investigation developed the purpose of beating the pulp, which is used in the making of this character of paper, and it showed that soda cellulose gives a better paper, as far as electrical use is concerned, than any of the other pulps.

The electrical resistance of a sample of paper was determined by placing it between two electrodes, one of which was made from a sheet of zinc resting on a glass plate, and the other was made from a layer of mercury, which exerted a weight of 5.5 grams per square centimeter on the paper. The two electrodes were connected with a source of electricity, and a galvanometer measured the current flowing through the paper.

The investigation showed that the electrical resistance of paper diminishes as the voltage across the electrode terminals increased. It was also shown that this resistance was gradually reduced, when the voltage was maintained constant, by the gradual absorption of water by the paper.

Making Pulp

IN UNITED STATES Patent, No. 1,531,728, there is described a process for converting hard stock into half stock. This comprises taking the stock in commercial sizes, cut only when in sizes upwards of about a yard in length, and boiling, washing, bleaching, and rewashing it at atmospheric pressure while subjecting it to the action of a beater roll and in the presence of a quantity of water, which is sufficient to hydrate and to prevent the dehydration of the fibers.

Rapid Analysis of Paper

THE various fibers that are found in paper possess different degrees of absorptivity for phenol and other aromatic bases. The first part of the method that is used in a rapid determination of the constituents of paper and that is described in Papier Fabrikant, volume 22, pages 184 to 185, is based on this fact.

The sample of paper is weighed and brought in contact with a titrated solution of the reagent. After a certain period of time has elapsed the residual reagent is determined.

The relative absorptive powers of various kinds of paper-making fibers are given in the following tabulation:

	Phenol	Aromatic base
Pure cotton	0.2	1.1
Rag pulp	0.5	3.0
Esparto	0.7	3.7
Sulphite cellulose, bleached	0.8	5.0
Straw pulp, bleached	1.1	6.2
Soda pulp, bleached	1.2	6.5
Sulphite cellulose, not bleached	1.2	6.6
Jute pulp, bleached	4.1	10.0
Mechanical wood pulp	8.0	12.0

If, for example, a paper is composed of B per cent of sulphite cellulose, M per cent of mechanical wood pulp, and C per cent of rag stock, and this paper absorbs P per cent of phenol and in a second test A per cent of the base, then the following equations may be written and the solution of these equations will afford an idea of the proportions of the various fibers in the paper:

$$B + M + C = 100 \qquad B \times \frac{0.8}{100} + M \times \frac{8}{100} + C \times \frac{0.5}{100} = P$$

$$B \times \frac{5}{100} + H \times \frac{12}{100} + C \times \frac{3}{100} = A$$

The presence of mechanical wood pulp in the paper can be detected by the color reactions in which a variety of reagent may be employed. These reagents and the colors that are obtained with them are given in the following tabulation:

Reagent	Color of mechanical wood pulp
Phloroglucine	Red
Pyrocatechin	Violet
Alpha naphthol	Green
Beta naphthol	Rose
Ortho aminophenol	Yellow
Phenylhydrazine	Yellow
Dimethyl para phenylenediamine	Red
Aniline sulphate	Yellow
Para nitraniline hydrochloride	Orange

Papers that are manufactured from straw stock, esparto, bamboo and the like contain pentosans. Hydrolysis of such materials with the aid of acids yields furfurol. The tabulation which follows indicates the weight of furfurol that is obtained from a unit weight of different stocks.

Nature of the pulp	Weight of furfurol per 100 kgs. of pulp
Rag stock	0.5
Jute stock	8.0
Bleached jute stock	5.0
Bleached sulphite pulp	4.0
Non-bleached straw stock	16.0
Bleached straw stock	13.0

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Write to THE PAPER INDUSTRY, 356 Monadnock Bldg., Chicago, Ill.

New York, May 1, 1925.

THE situation in the paper market is rather irregular at the present time insofar as concerns the volume of business current. Demand for paper is not poor; neither is it altogether satisfactory from the manufacturer's and jobber's point of view. Some classes of paper are wanted in good tonnage and are moving into consuming channels in a very gratifying manner, whereas activity in other parts of the trade is extremely spotty with a good deal of complaint heard regarding conditions. It would seem, in other words, that the paper market is in about the same position as most other commodity markets. It has not yet recovered from the general slowing down of business experienced early in March and which was quite pronounced throughout that month and which was in much evidence also during April. There is a common hesitancy noted among consumers to buy other than against immediate requirements; this is a situation which is not characteristic alone of the paper market but is to be observed in practically all markets. Everyone seems to be endeavoring to keep capital liquid, to refrain from anticipating wants and to refuse to lay in stocks, and the result is that demand for paper mostly is of small volume; that is to say, consumers in general are placing orders for light amounts of paper at a time so that buying lacks normal volume.

There is no denying that, from every angle, the paper market is in a very healthy condition. There are no signs of any surplus holdings of any kind of paper, no indications of worthwhile accumulations either at mills, in the hands of jobbers or in consuming establishments. Mills thus far this year have produced only as their requirements have necessitated; in fact, if figures were available doubtless they would show that less paper is held in stock in manufacturing plants at present than on the first of the year. This means, of course, that any increase in demand that occurs will have to be followed by an almost immediate increase in production because manufacturers will have to speed up their operations to take care of any additional business. Prices of paper also are in healthy position. Compared with most other manufactured commodities, the bulk classes of paper are being marketed at relatively low prices. There have been some sharp advances in raw materials entering into paper but few advances of any consequence have been noted in any kind of paper in some months; as a matter of fact, the tendency in the paper market has been more in a downward direction.

A good many conflicting reports are heard regarding the condition of the market. By way of example, in some quarters much complaint is registered over the dull market for book paper, it being stated that mills are sorely in want of orders and that in certain instances prices are being shaded as an inducement to consumers to buy. On the other hand, it is known that some of the largest book paper mills in the country are well sold up and are refusing to promise deliveries nearer than six weeks ahead; moreover, they are very firm in their price ideas and are not even so much as entertaining price concessions. The explanation of this situation is that orders have not been evenly distributed, that some manufacturers have been fortunate in booking a good volume of business whereas others, for one reason or another, have not secured their proportionate share of the orders placed.

Obviously the paper industry suffers from the effects of conditions in other trades; this is a well established truth because paper business is so dependent on activity in various consuming lines. Generally speaking, trade has been slow during the last couple of months. Business has been strictly of current character—the consumer, the dealer and the producer has bought merely to satisfy direct needs. The morale of the commercial world has been somewhat shattered, for what reason it is hard to state, but it is a fact that business has proceeded in a most cautious manner. There are signs that this period of ultra caution is coming to an end. The signs are not altogether concrete as yet but they are visible enough to prompt one to believe that better times are in store. As soon as manufacturers and merchants regain a bit more confidence in the outlook they will be more willing to buy, not only against immediate requirements but to lay in stocks, both of raw and finished products.

Production of paper in the United States in February as reported by identical mills to the American Paper and Pulp Association and co-operating organizations showed a decrease of 8 per cent compared with the January output, following a 7 per cent increase in January over December, according to the association's monthly statistical summary. Total production in February amounted to 448,080 net tons of paper of all kinds, compared with 487,536 tons in January. All grades showed a decrease in production as compared with January. Mill stocks of paper decreased during February. At the end of that month, mills held a total of 231,276 tons of all kinds of paper, against 240,424 tons at the end of the preceding month. Shipments from mills totaled 454,303 tons in February, which means more paper was shipped out than was produced during that month.

Newsprint probably is enjoying greater market activity than any other class of paper. Demand for print paper is excellent; not only are publishers taking every pound coming to them on contract but they frequently are entering the market to purchase additional supplies. There is little or no talk in the trade anent the probability of a revision in newsprint, prices, a consensus of opinion is that present prices will be maintained for some time to come or at least so long as mills continue as busy as they are now which seems indefinite.

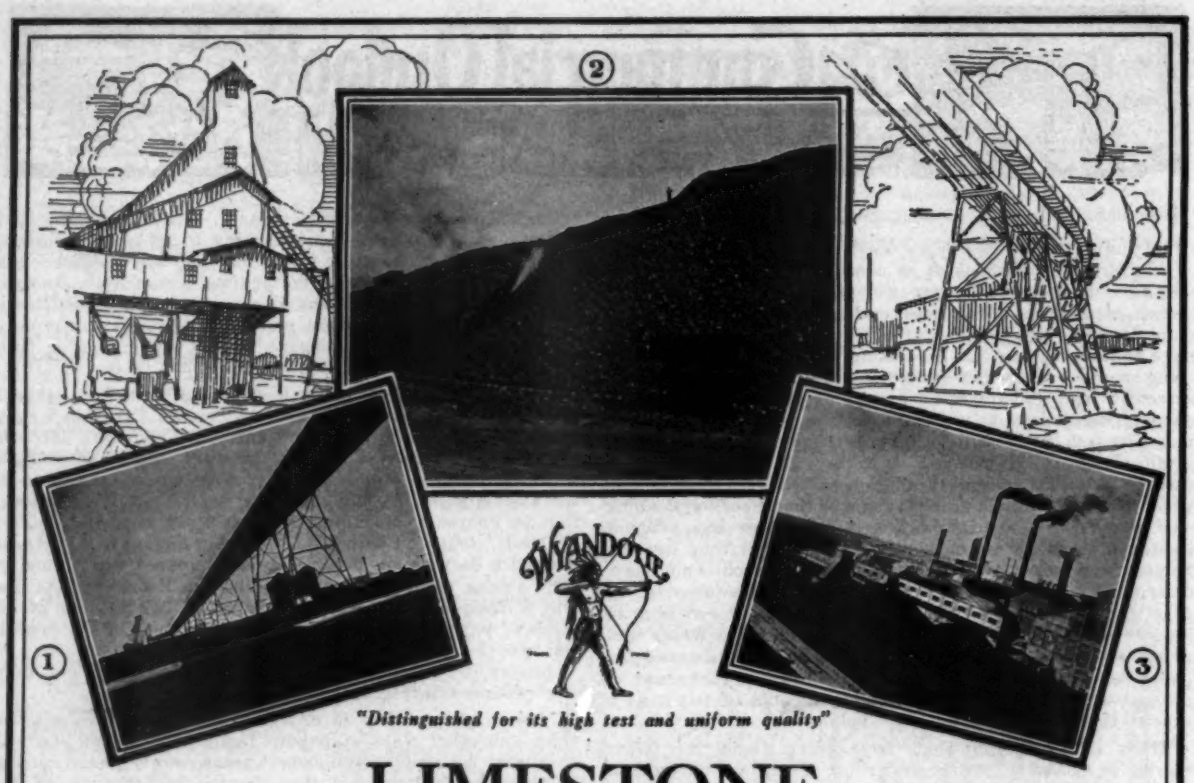
A new high record of newsprint production was established in March when United States mills produced a total of 126,843 tons and Canadian mills made 126,267 tons, a total for both countries of 253,110 tons, compared with 232,656 tons in March, 1924. For the first quarter of this year, newsprint production in the United States and Canada totaled 732,769 tons, showing a remarkable gain over the 704,739 tons manufactured in the same period a year ago and a still more remarkable increase over the 670,340 tons produced in the first three months of 1923.

Book paper demand is fair. There is room for improvement since some mills could readily accommodate a good deal more business; on the other hand, some plants are well engaged and are sold well ahead. Prices of book paper are quotably steady although there are reports of certain manufacturers shading prices in some cases, especially where tonnage orders are concerned.

Coarse papers are moderately active. The movement of both wrapping and tissue has been of limited volume recently, insofar as involves individual orders, and yet the aggregate demand has been quite good. Prices are fully maintained and in some lines the tendency is upward.

Fine papers are wanted in a consistent way but buyers are exerting much caution in placing orders, and seldom are committing themselves except on supplies directly needed. Manufacturers complain of the small volume of most orders yet reports state that mills down East are securing enough business to warrant production on about an 80 per cent of capacity basis. Prices are distinctly firm and give promise of remaining so if for no other reason than the relatively high cost of raw materials.

Box boards are holding steady in price and demand has shown some expansion lately. Mills in the East are quoting $50 a ton delivered New York for plain chip and $52.50 to $55 for filled news board, and it is asserted that seldom are sales made below these prices.



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Papermaking Rags

It might be said that the usual seasonal condition prevails in the papermaking rag market. It is a common thing in the spring for rag consumers to buy very guardedly, to confine their orders to supplies immediately needed, and for prices of most classes of rags to show a weak undertone. This is exactly the situation in the market at present. There is a fair demand for some grades of papermaking rags but at best the movement is restricted as to aggregate volume since paper mills are buying in a more or less hand-to-mouth way while realizing that this is the time of the year when rag collections are largest. Prices also, in most instances, display easiness. Not a great deal of change has occurred in quotations during the last month because the customary spring decline was anticipated to prior to April and market levels had sunk to where prices steadied themselves to some degree and resisted any further recession.

It is becoming more and more manifest every day that the future position of rag values will depend almost entirely on the demand from consuming quarters. Ordinarily supply and demand regulate prices. During the next few months demand is going to be the all-important factor in fixing prices of papermaking rags. This is so because present available supplies of rags are, from all indications, just limited enough to make prices hinge altogether on the scope of buying by mills. Spring collections in the United States, it is declared, have fallen far short of normal. Various reasons are advanced for this, some of which are that high prices during the winter stimulated collections and therefore kept accumulations down, also that fewer rags reach the collector these days because of their use for the family automobile, and further that the consumption of rags for other purposes than papermaking has increased to such an extent that dealers have smaller supplies to draw on to fill their paper mill orders.

The supply situation abroad is equally as bullish—from the seller's standpoint, it is asserted. Government figures show that all records of rag importations have been shattered during the last six months. More rags have been brought into the United States from European countries than ever before; the increase, in fact, has been nearly startling, being something like 40 to 50 per cent above any similar period in the past. This means, it is contended, that European supplies have been pretty well liquidated, and that paper manufacturers in the United States cannot hope to obtain anything like the quantity of rags from abroad in the next six months that they have during the last half year because dealers in Europe necessarily will have to have time to accumulate further stocks.

At the moment, the market is very much of a buyer's market. Demand has slumped to a degree where dealers in at least some cases have rags on hand which they are anxious to dispose of, and there is little doubt that supplies have accumulated in certain quarters. However, it is indicated that it would not require a great deal of buying on the part of paper mills to clean up these stocks and put the market in a strong statistical position. Then, dealers and importers likely would encounter some difficulty in replenishing their holdings, and prices would probably rise.

Roofing rags are quoted around a basis of 2.15 cents per pound at dealers' shipping points in the East for No. 1 packing, whereas in the West prices range higher, packers asking 2.35 cents and higher at shipping points. No. 2 roofing stock is quoted at 1.90 cents in the East and around 2.20 cents in the Middle West. Foreign dark colored cottons have sold down to 2.10 cents a pound ex dock New York but most quotations now range around 2.25 cents.

New cuttings of most grades are holding steady in price, and dealers put much emphasis on the difficulty they are having in getting normal amounts of such rags from clothing houses. The grades in principal demand are bleachable cuttings, such as white shirt cuttings, fancy shirt, washables, unbleached muslin, blue overall and light silesia cuttings.

Demand for old whites is slow and prices are mainly nominal. However, quotations are between 7 and 8 cents a pound at shipping points for No. 1 repacked whites, and 4.50 to 5 cents for No. 2 repacked whites. Repacked thirds and blues are quoted at about 4 cents or slightly less at dealers' points, and rough packing at 2.25 to 2.50 cents.

Average quotations f. o. b. shipping points and ex dock New York are as follows:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	15.00-15.50
White shirt cuttings, No. 2	11.00-11.50
Fancy shirt cuttings	10.50-10.75
Washables, No. 1	9.00- 9.25
Unbleached muslins	14.50-14.75
White lawns	13.75-14.25
Overall cuttings, blue	11.50-11.75
Black silesias	6.25- 6.50
Light flannelettes	12.50-13.00
Canton flannels, bleached	13.50-13.75
Canton flannels, unbleached	12.25-12.50
Shoe cuttings, bleached	13.00-13.50
Shoe cuttings, unbleached	12.00-12.50
Light silesias	10.75-11.25
O. D. khaki cuttings	7.00- 7.25
Mixed khaki cuttings	6.25- 6.50
Corduroy cuttings	6.00- 6.25
Cottonade cuttings	5.25- 5.50
Linens, No. 1 white, foreign	16.00-17.00
Light prints, foreign	7.75- 8.00
Old Stock—	
Whites, No. 1, repacked	7.00- 8.00
Whites, No. 2, repacked	4.50- 5.00
Whites, house soiled	3.50- 3.75
Whites, street soiled	3.00- 3.25
Lace curtains	5.75- 6.00
Thirds and blues, rough	2.25- 2.50
Thirds and blues, repacked	3.75- 4.00
Black stockings	4.50- 4.75
Cotton canvas, No. 1	5.75- 6.25
White cotton batting	4.25- 4.50
Roofing, No. 1	2.15- 2.35
Roofing, No. 2	1.90- 2.20
Dark colored cottons, foreign	2.20- 2.30
Blue linens, foreign	5.50- 6.00
Gray linens, foreign	6.00- 6.50
White linens, foreign	10.50-11.50
Light prints, extra, foreign	4.00- 4.25

Rope and Bagging

Reports generally tell of a steady call from paper manufacturers for domestic old rope, whereas it is stated most buyers are more or less neglecting imported old rope. Perhaps consumers are filling their needs with the domestic article and therefore are holding off buying foreign supplies, which is a logical condition, because as a general thing domestic old rope is preferred by paper mills. Domestic No. 1 old manila rope is reported selling at 6.75 to 7 cents a pound f.o.b. dealers' shipping points, and packers say they are readily disposing of about all the supply they can gather. On the other hand, mill quotations on foreign old rope frequently do not exceed 6.25 cents ex-dock New York or other American Atlantic ports, although importers declare they cannot buy abroad

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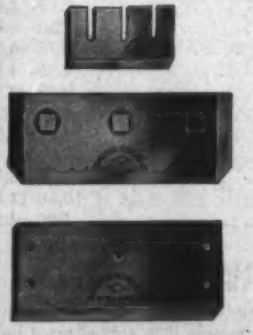

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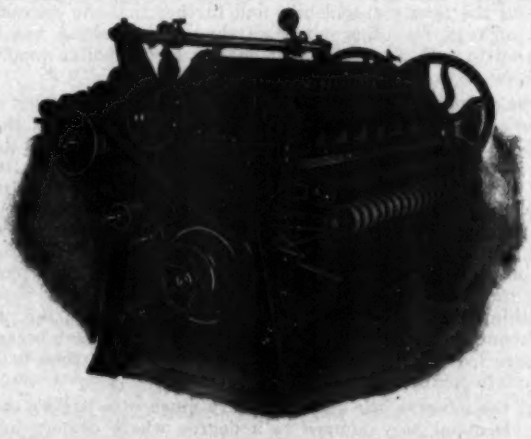

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cheap enough to permit them to sell to consumers at this price level profitably. Mixed strings are quotably firm and are in good demand.

Roofing bagging has eased off in price. Some sizable tonnage sales of foreign bagging of this quality have been reported at 1.50 to 1.60 cents a pound ex-dock New York, and domestic bagging is bringing only slightly more than these prices at dealers' shipping points. No. 1 scrap bagging is firm around 2.65 cents a pound at dealers' points and paper mills are buying in fairly good volume.

F.o.b. shipping point and ex-dock New York quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	2.75-3.00
Gunny, No. 1 foreign	2.65-2.90
Scrap bagging, No. 1	2.60-2.75
Roofing bagging	1.50-1.65
Wool tares, heavy	2.75-3.00
Wool tares, light	2.65-2.85
Manila rope, No. 1 foreign	6.50-6.75
Manila rope, No. 1 domestic	6.75-7.00
Sisal strings	3.00-3.25
Mixed string	1.90-2.25

Old Paper

Following a rather lengthy period of dullness, the waste paper market is beginning to show signs of renewed life. There is a better inquiry emanating from consuming sources, according to reports, and paper and board manufacturers are said to be showing more willingness to meet the prices quoted. Also there is an improved sentiment among dealers, most of whom believe that higher prices and bigger business are in prospect. It is declared that collections of most grades of old paper have been so curtailed that the limited supply coming into the market is in itself making for a firmer price tone, and sellers contend that it this factor which will carry values higher as soon as consumers increase their buying.

Shavings are quoted from 3.40 cents a pound upwards f.o.b. shipping points for No. 1 hard white, and between 2.90 and 3.15 for No. 1 soft white shavings. Demand for old magazines, especially mixed books, has spruced up a bit, but prices evince little change, dealers quoting No. 1 heavy magazines at 1.10 to 1.25 cents a pound at shipping points and crumpled books at 80 to 90 cents per hundred pounds. Old No. 1 kraft paper is quoted around 1.85 cents a pound at dealers' points, and white blank news at 1.90 cents. Flat folded news is selling between 55 and 65 cents a hundred pounds at shipping points, while No. 1 mixed paper is quoted on a range of 40 to 50 cents.

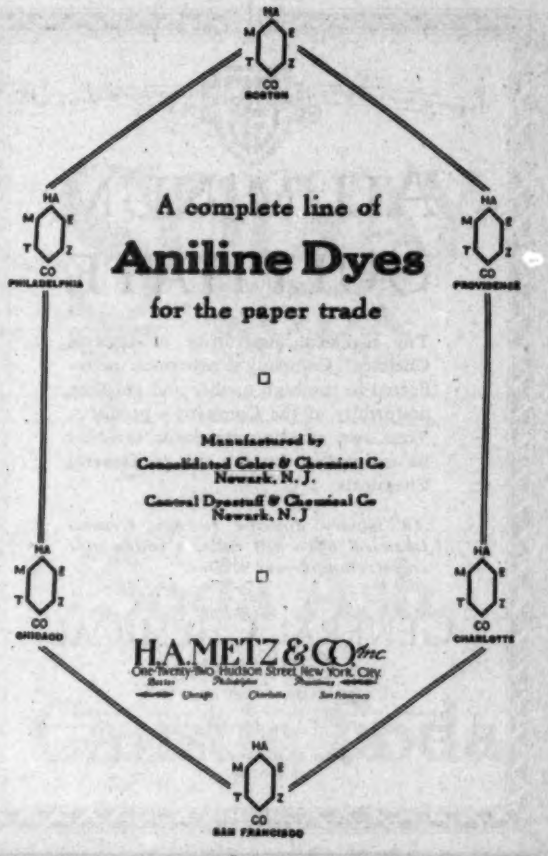
The following are prices f.o.b. shipping points:

	New York and Chicago.
Hard white shavings, No. 1	3.40-3.65
Hard white shavings, No. 2	2.90-3.15
Soft white shavings	2.90-3.15
Colored shavings	1.25-1.50
Heavy book, No. 1	1.10-1.25
Crumpled book, No. 1	.80- .90
Ledger stock	1.40-1.60
Kraft, No. 1	1.80-1.90
Manilas, No. 1	.65- 75
White blank news	1.85-2.00
Over-issue news, No. 1	.70- .80
Folded news	.55- .65
Mill wrappings	.65- .75
Mixed paper, No. 1	.40- .50
Common paper	.30- .35

Chemical Pulp

Most domestic producers of chemical pulp are in a fairly satisfactory position at present, according to reports. It is stated they have a good volume of orders on their books, and that about all the supply they have to direct to the open market is finding a ready outlet. Moreover, a majority of domestic producers are conserving their surplus production against their own needs and therefore are not very anxious about effecting sales to others than regular customers.

The market, insofar as current activity is concerned, is



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Cable Address: Synergen, N. Y.

ZAREMBA EVAPORATORS

FOR

Soda Black Liquor
Sulphate Black Liquor
Sulphite Waste Liquor

Fifty large Zaremba Evaporators in the pulp mills of this country, many on repeat orders, testify to their excellence.

Consultation invited on new projects or where old installations should be rebuilt to reduce liquor losses, improve steam economy, or increase capacity.

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506 Crosby Building BUFFALO, N. Y.

UNION SULPHUR

The Best for Better Sulphite Pulp

Guaranteed 99½ Per Cent Sulphur
Combined with 100 Per Cent Service

Substantial warehouse stocks always maintained at strategically located seaboard stations insure

Prompt Delivery Against All Orders

The Union Sulphur Company

Frasch Bldg., 33 Rector St., New York, N. Y.

EASTERN MANUFACTURING COMPANY

BLEACHED SULPHITE

Made from spruce grown in the forests of Northern Maine.

Send for Samples.

EASTERN MANUFACTURING CO.

292 Madison Avenue NEW YORK

comparatively quiet. Consumers have let down in their buying to some extent, presumably because they have placed orders which will keep them fairly well supplied for a time. Nevertheless, the movement against contracts and back orders is of moderately large volume, and most producing plants are working at a good rate of capacity at the present time, and do not have to bother about securing many additional orders for a while, it is said.

Prices rule quite steady. So far as is observed, there is little or no price cutting, and, if anything, the tendency of market values is in an upward direction. Bleached sulphite is quoted at 4 cents a pound in a majority of cases, with 3.75 cents about the bottom figure named in any part of the market. News grade unbleached sulphite is selling around 2.65 cents at pulp mills, and easy bleaching sulphite at 3 cents. Quotations on No. 1 kraft pulp range from 2.85 to 3.10 cents a pound at producing points, while bleached soda pulp is quoted 3.50 to 3.75 cents at pulp plants.

F.o.b. pulp mill quotations follow:

Bleached sulphite	3.75-4.25
Easy bleaching sulphite	3.00-3.10
Unbleached sulphite, No. 1	2.75-3.00
News grade sulphite	2.60-2.75
Soda pulp, bleached	3.50-3.75
Mitscherlich, unbleached	3.25-3.75
Kraft, No. 1	2.85-3.10
Screenings, refined	1.40-1.60

Mechanical Pulp

As is more or less customary during the spring, quotations on mechanical pulp have shown a little easing. This is the result of increased production, apropos of improved water conditions. Reports say that grinders have been exceptionally well supplied with water this spring, and consequently have speeded up operations to a point where there is plenty of ground wood to go around. At the same time, it is asserted most producers are well booked on orders, and, moreover, are using up large quantities of pulp themselves, so that the market is far from topheavy with supplies.

Domestic grinders quote around $30 a ton f.o.b. pulp plants for prime spruce ground wood for prompt shipment, while quotations from Canadian manufacturers range from a low of about $28 per ton at producing points up to around $32, depending on the air dry test and the freight to consuming centers. Offerings of Scandinavian ground wood have increased in some import quarters and $33 to $34 a ton ex-dock New York or other American Atlantic ports are the prices asked generally.

Chemicals

Papermaking chemicals are in fair demand. Consumers are buying in rather small volume as regards individual orders, but the movement on contracts is fully normal and spot demand is holding up passably well. Casein is quoted around 12 cents per pound, duty paid on the foreign product. Bleaching powder is quotably unchanged at 1.90 to 2.10 cents a pound at works, the lower price applying to contracts. Prices of caustic soda range between 3.10 and 3.20 cents per pound for spot delivery.

Average quotations f.o.b. works are as follows:

Alum, lump ammonia	3.25- 3.50
Alum, lump starch	3.75- 4.00
Blanc fixe, powder	3.75- 4.00
Bleaching powder	1.90- 2.10
Brimstone (long ton, at mine)	18.00-19.00
Casein (duty paid)	11.50-12.50
Caustic soda, spot delivery	3.10- 3.20
China clay, domestic washed	12.00-16.00
China clay, foreign	15.00-20.00
Rosin, grade E	6.60- 6.80
Satin white	2.00- 2.25
Soda ash, 58 per cent light (bags)	1.38
Starch, papermakers', in bags	3.40- 3.70
Talc (ton)	16.00-17.00

SOLVAY
STANDARD IN SODA SINCE 1881

Soda Ash

Caustic Soda

Quality and Service Guaranteed by the largest source of supply.

Over 75 stock distributing points assure prompt shipment with minimum transportation charges.

The Solvay Process Co.

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DETROIT, MICH.
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REPUTATION

WHAT is the secret of the popularity of International Salt—and the fact that it is the standard salt of industry?

The splendid reputation of International Salt was gained by molding knowledge, experience and the advantages of comprehensive refining facilities into a service that takes care of your every requirement.

This reputation is your guarantee of satisfaction now and in the future—a promise that International Salt will maintain quality and back it up with every principle of fair dealing.

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INTERNATIONAL SALT COMPANY, Inc.

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Quality First

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There is no need for specifications when you order Diamond Alkalies—The quality is guaranteed—Diamond Soda Ash over 99% pure—Diamond Caustic Soda over 98% pure.

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DIAMOND ALKALI COMPANY
PITTSBURGH, PA.

New Papers

Writing—	
White rag	22-45
White sulphite	11.30
Colored rag	17-40
Ledger—	
White rag	22-50
White sulphite	13-30
Colored sulphite	40-30
Colored rag	17-50
Bonds—	
White rag	20-45
White sulphite	10-30
Colored sulphite	10-30
Colored rag	17-50
Book—	
No. 1 S. & S. C.	6.25- 7.00
Machine finished	6.00- 6.75
English finished	6.25- 7.00
Coated and enameled	8.00-14.00
Lithograph, M. F.	9.00-15.00
Newsprint—	
Rolls, contract	3.50- ....
Rolls, transient	3.65- ....
Sheets	4.00- 4.25
Side runs	3.00- 3.25
Cover Stock—	
Coated, both sides	10.25
Coated, one side	10.15
Tissue—	
No. 1 white, 20x30	.75- .85
No. 2 white, 24x36	.70- .75
No. 1 manila, 24x36	.70- .75
Kraft	.90- 1.00
Wrapping—	
No. 1 Kraft	5.50- 6.25
No. 2 Kraft	5.00- 5.50
Boards—	New York and Chicago
Solid news	55.00-60.00
Straw	50.00-55.00
Plain chip	50.00-55.00
White coated chip	65.00-70.00
Manila coated chip	60.00-65.00
Binder's board	70.00-75.00

The Forestry Problem

Fire Hazard and Insurance Chief Factors in Growing Forest Crops

ROYAL S. KELLOGG, secretary of the News Print Service Bureau, New York, is doing commendable work in the interest of wood users by broadcasting talks to the public on forestry requirements. His latest talk on the forestry problem was broadcast from WEAF in New York on Thursday, April 30.

To grow the wood that is needed for the manufacture of paper pulp is the chief requirement, not the search for substitutes. Forestry means the growing of timber crops for use, just as farming is the growing of food crops for use. This is the essential problem of forestry, as stated by Mr. Kellogg. The necessity for conservation and replanting is great because of the destruction of timber through fires and overdrafts on supplies. At the present time our forests are being destroyed much more rapidly than they are being reproduced.

Mr. Kellogg pointed out that there are 50,000 forest fires reported annually in the United States. Besides destroying much valuable timber these fires cause inestimable damage to young growth and to soil fertility. Fire is the most deadly enemy of the forest and there is no use in trying to practice forestry where fire is not controlled. The habit of burning over the woods in the spring that prevails even within the limits of New York was roundly condemned by the speaker.

He said that the greater proportion of all forest fires were generally of human origin and preventable if proper care were exercised. Thus 594 out of 904 of the forest fires in New York State in 1924 were caused by campers, smokers, fishermen and hunters, smokers alone being credited with 20 per cent of the destruction.

Enumerating the basic requirements of forest policy in the United States, Mr. Kellogg mentioned (1) the necessity of efficient forest protection; forests must be made insurable risks if forestry is to succeed. (2) Forest surveys and inventories—these are necessary because we must know what we have before we can intelligently plan what to do. (3) Management of forests for continuous production through methods of cutting or replanting. (4) Research upon forest growth and reproduction through experiment stations similar to agricultural experiment stations. (5) More complete utilization of forest products through scientific investigation into the properties and uses of the various woods.

Until recent years, timber of natural growth was so cheap and abundant that the private owner could not afford to engage in forestry, where the time element is long, the hazards many, and the financial return often less than in many business enterprises. Mr. Kellogg said the tide is now turning and many paper and lumber manufacturers are definitely planning for permanent timber production to supply their mills with raw material. He added that the number of paper manufacturers growing timber as crops would be increased when the fire hazard was reduced and an equitable system of forest taxation was adopted by the various states.

Mr. Kellogg emphasized the point that the problem of forestry in the United States was an educational and economic one, saying that there must be a public sentiment which will no longer permit forest fires and a recognition of the peculiar characteristics of the forest crop, so that it shall not be taxed to death before it is ready to harvest. He closed a most interesting and suggestive popular address with the statement that we have all the forest area needed in this country to produce one essential timber supply. The leading European countries in the practice of forestry, such as France, Germany and Scandinavia, have succeeded in maintaining the proper balance between growth and consumption, and "to say that we shall eventually do less is no compliment to the energy, initiative and resource of the American people."

Supply Dealers Change Assn. Name

At a meeting and dinner in Conte's Restaurant on April 15, the Waste Merchants' Association of New York, whose membership comprises practically all of the important concerns in the metropolitan area handling papermakers' supplies, changed its name to the New York Association of Dealers in Paper Mill Supplies, Inc., and announced that the organization had been incorporated under New York State laws. Vice-President Walter Clark presided at the meeting in the absence of President Charles R. McBride. The association is about fifteen years old. For a long time up to four or five years ago its name was the Associated Dealers in Paper Mill Supplies of New York, which was changed to the Waste Merchants' Association of New York. Since the membership is composed almost exclusively of firms dealing in raw materials for paper mills, it was decided to make the association title more specific, hence the change to the new name and the incorporation of the organization under the new name.

At the meeting prizes of watches, watch fobs and loving cups were presented to members who secured the greatest number of advertisements for the association journal published as a souvenir of the annual dinner during Paper Week in February.

The B-D-C QUALITY PULPS

HAFSLUND NORWAY

"HAFSLUND BEAR"
Bleached Sulphite

F: HAGA

"FORSHAGA"
Bleached Sulphite

KRAFT HURUM NORWAY SPECIAL

"HURUM SPECIAL"
Extra Strong Kraft

KOOS BAC

"BAMBLE"
Extra Strong Kraft

The Borregaard Company
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PRICE & PIERCE, LTD.
17 East 42nd Street, NEW YORK CITY

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SELLING AGENTS
for Bathurst Pulp in the United States

Unbleached Sulphite 50 tons daily
Kraft Pulp 50 tons daily

Our pulp is made from Canadian Spruce
We ship in sheets, baled

BATHURST, NEW BRUNSWICK, CANADA

Bleached and Unbleached
SULPHITES
KRAFT PULPS

Foreign and Domestic
GROUND WOOD

PERKINS-GOODWIN CO.
NEW YORK
33 West 42nd St.

PAPER

PRINTING PAPER
OF
EVERY DESCRIPTION

EXPORTS

Exports of paper from the United States in February last showed a decline in total value from the shipments in the same month of last year, according to statistics compiled and issued by the Department of Commerce. Exports in February, 1925, were valued at $1,595,641, contrasted with a value of $1,967,470 in the similar month a year ago. Some classes of paper, however showed an appreciable gain during February, both in tonnage and value over the same month of 1924. Newsprint exports in February last amounted to 3,749,093 pounds, valued at $175,262, against 2,812,069 pounds of a value of $149,354 in the same month a year ago. Book paper, not coated, exports also increased, shipments in February last totaling 1,038,106 pounds, valued at $117,459, contrasted with 929,384 pounds of a value of $113,069 in February, 1924.

Exports of kraft paper in February last totaled 29,817 pounds, valued at $3,035, against 51,329 pounds of a value of $6,297 in February a year ago, while exports of other wrapping paper aggregated 1,938,250 pounds, valued at $156,686, against 1,921,619 pounds of a value of $174,241 in February last year. Exports of tissue and crepe paper in February amounted to 259,223 pounds, valued at $59,132, compared with 182,001 pounds of a value of $48,553 in February a year ago.

Box board exports in February were 726, 471 pounds, valued at $25,393, while shipments of other paper and straw board amounted to 1,876,869 pounds of a value of $99,470. Exports of fancy writing papers totaled 29,943 pounds of a value of $9,803, and of other writing paper 267,027 pounds, valued at $39,937. Sheathing and building paper exports in February amounted to 781,197 pounds, valued at $34,348. Greaseproof and waterproof paper was exported to the amount of 122,052 pounds, of a value of $13,416, in February.

IMPORTS

Wood Pulp

Wood pulp is being imported into the United States in large volume. Nearly every day or so a steamer arrives at one of the important American Atlantic ports with fair-sized shipments of some kind of pulp from Scandinavia, Germany or elsewhere in Europe, and the movement of supplies from Canada into the States is on a large scale also. If the rate of import established in January and February is maintained throughout the currenut year there is no doubt a new high record of pulp importations will be reached in 1925; for that matter, there is every indication at present that imports this year will be at least normal, if not much better than normal.

Imports in February, according to Department of Commerce statistics, totaled 93,199 net tons of chemical pulps, valued at $5,714,555, compared with 126,999 tons in January last of a value of $7,489,052, and 110,932 tons of a value of $6,914,441 in February, 1924. Mechanical pulp imports in February amounted to 24,607 net tons, valued at $781,336, contrasted with 20,056 tons of a value of $636,070 in January last, and 15,747 tons of a value of $525,839 in February last year.

Advices tell of a firm condition in the pulp markets in Europe. Scandinavian mills are well sold ahead; some of them are said not to have a pound of pulp to offer for the remainder of this year, while, taken collectively, the mills in Sweden doubtless are far better sold up than they are ordinarily at this period of the year. Moreover, it is reported consumption is increasing throughout Europe and that consequently manufacturers in Scandinavia are not relying on the American market as much as they have been.

The market here is comparatively quiet. There is a good and steady movement of pulp against contracts and back orders but consumers in a great majority of cases have held off in buying since the ending of the strike in the Swedish mills. Current demand therefore is somewhat spotty, and it is lacking in volume as well. Paper and board manufacturers, most of whom have sizable supplies coming to them on back commitments, are proceeding on the theory that there will be plenty of pulp during the rest of the year, and also are holding off buying pending the receipt of first open water shipments from Sweden. So far as has been heard, the Baltic has not yet opened up and first open water shipments have not started, but any day now these spring supplies should begin to move to the United States.

The tone of prices is quite firm. There is less pressure to sell pulp than is the case usually when the market is quiet, and importers in general are maintaining quotations, owing to the firmness of prices quoted at primary sources abroad. Bleached sulphite of prime quality is quoted around 4 cents a pound ex dock New York or other American Atlantic ports, and some mill brands are held for 4.10 and up to 4.25 cents. On the other hand, German bleached sulphite is reported available at about 3.85 cents ex dock New York. Strong unbleached sulphite is selling around 2.85 cents on the dock at New York for No. 1 grade, and Swedish standard prime kraft pulp is firm at 3 cents ex dock with 2.90 cents about the minimum price named in any quarter. Ground wood of Scandinavian origin is quoted at $33 to $35 a ton ex dock New York.

Receipts at the port of New York during April and current market quotations ex dock New York follows:

Bleached sulphite, No. 1	3.85- 4.25
Unbleached sulphite, strong, No. 1	2.80- 3.00
Unbleached sulphite, No. 2	2.60- 2.80
Easy bleaching sulphite	2.90- 3.15
Mitscherlich unbleached, genuine	3.00- 3.25
Mitscherlich unbleached, ordinary	2.70- 2.85
Kraft, standard Swedish	2.90- 3.10
Ground wood, per ton	33.00-35.00

Scandinavian Pulp Agency, 325 bls. from Gothenburg; Homan & Puddington, 6,600 bls. from Wolfville, N. S.; Johaneson, Wales & Sparre, 5,400 bls. from Hernosand; Lagerloef Trading Co., 2,283 bls. from Kotka and 1,505 Hamburg; Castle & Overton, 1,375 bls. from Hamburg; Ira L. Beebe & Co., 2,770 bls. from Hamburg and 13,618 Konigsberg; Equitable Trust Co., 664 bls. from Hamburg; Goldman, Sachs & Co., 400 bls. from Hamburg; International Acceptance Bank, 705 bls. from Rotterdam and 700 Hamburg; Tidewater Paper Mills Co., 12,345 bls. ground wood from Liverpool, N. S.; J. Anderson & Co., 925 bls. from Hamburg and 3,540 Sharpsborg; E. J. Keller Co., 1,438 bls. from Hamburg; Chemical National Bank, 300 bls. from Sarpsborg; Merchants National Bank of Baltimore, 750 bls. from Sarpsborg; Central Union Trust Co., 675 bls. from Sarpsborg; Order, 6,105 bls. from Kotka, 625 Gothenburg, 668 Hamburg, 449 Helsingfors, and 11,754 bls. ground wood Weymouth, N. S.

Paper Stock

Imports of nearly all kinds of papermaking raw material other than wood pulp have shown a falling off. Rags continue to arrive in fairly large amounts but the tonnage of importations during the last month has not begun to measure up to that of earlier in the year, while receipts of old rope, bagging and other materials have decreased also. The decline doubtless reflects the quieter market for paper stock recently. Imports of papermaking rags in February, according to Government statistics, amounted to 57,351,538

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Rosin Size, Satin White, Clays, Fillers
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Tank Cars 1-Ton Containers 150-Lb. Cylinders

Commercial Sulphate of Alumina
Standard Bleaching Powder

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EASTERN AGENTS of Sulphite Pulp. Made by
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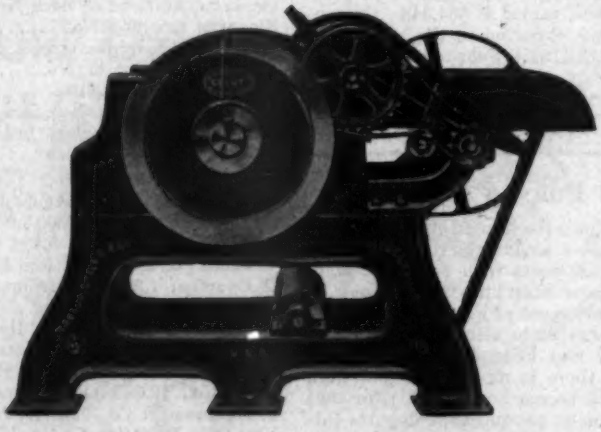

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LET US FIGURE IT OUT FOR YOU

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WATEROUS ENGINE WORKS
Brantford, Ont., Canada
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Sole Agents for Europe

pounds, valued at $1,675,992, compared with 31,440,555 pounds of a value of $665,987 imported in the same month a year ago. Imports of old bagging and waste paper in February totaled 10,732,444 pounds, valued at $174,198, against 7,910,540 pounds of a value of $91,223 in the same month last year, while imports of old rope and other paper stock in February amounted to 5,040,290 pounds, valued at $273,829, contrasted with 7,490,548 pounds of a value of $413,373 in February, 1924.

Imports of all kinds of papermaking stock through the port of New York in April, with names of consignees, compiled from manifests of steamers reaching that port during the month, were as follows:

Old Rope

Brown Bros. & Co., 277 coils and 14 bls. Hull, 170 bls. and 152 coils Rotterdam, 381 bls. Venice, 188 coils Hamburg, 178 coils Bristol and 87 bls. Antwerp; Ellerman's Wilson Line, 44 bls. and 216 coils London; International Purchasing Co., 48 coils Rotterdam; N. E. Berzen, 71 bls. Marseilles; Cohen & Co., 7 bls. Nassau; Manufacturers Trust Co., 69 bls. Antwerp; Equitable Trust Co., 289 bls. Rotterdam; United Fruit Co., 13 bls. Cristobal; Maurice O'Meara Co., 81 coils Antwerp; E. J. Keller Co., 220 bls. Hamburg; Order, 33 bls. Barcelona, 6 coils London, 142 coils Leith, 1,000 bls. Puerto Castilla, 172 coils Copenhagen and 4 bls. Oran.

Old Bagging

Darmstadt, Scott & Courtney, 42 bls. Rotterdam; Bank of the Manhattan Co., 12 bls. Hamburg; Castle & Overton, 140 bls. Havre and 54 Antwerp; E. Butterworth & Co., 105 bls. Rotterdam; W. Schall & Co., 84 bls. Antwerp; Irving Bank-Columbia Trust Co., 88 bls. Liverpool; E. J. Keller Co., 658 bls. Rotterdam, 206 Hamburg, 172 Antwerp and 153 Manchester; Order, 67 bls. Alexandria, 172 Glasgow, 166 Bremen, 55 Rotterdam, 71 Genoa, 83 Antwerp and 110 Genoa.

Rags

Stone Bros. Co., 117 bls. Rotterdam, 51 Glasgow, 26 Bremen, 229 Antwerp and 66 Leith; L. Sher & Sons, 31 bls. Rotterdam; L. H. Abenheimer, 50 bls. Antwerp, 107 Havre and 147 Marseilles; Daniel M. Hicks, Inc., 47 bls. Dundee; Katzenstein & Keene, 50 bls. Dunkirk; Maurice O'Meara Co., 26 bls. Dunkirk and 26 Manchester; Steinberg & Son, 4 bls. Antwerp; E. J. Keller Co., 1,590 bls. Rotterdam, 213 Marseilles, 274 St. Nazaire, 947 Hamburg, 860 Havre, 32 Amsterdam, 591 Bremen, 373 Antwerp, 90 Manchester, 650 Kobe and 35 London; Atlas Waste Mfg. Co., 183 bls. Rotterdam, 84 Havre and 20 Osaka; S. Birkenstein & Sons, 38 bls. Bremen; Atterbury Bros., 67 bls. Havre; Victor Galaup, Inc., 19 bls. Havre; S. Silberman Co., 204 bls. Genoa, 38 Rotterdam and 130 Hamburg; G. Carrizzo, 269 bls. Leghorn; Albion Trading Co., 147 bls. Marseilles; Textile Waste Merchandising Co., 134 bls. Marseilles; William Steck & Co., 195 bls. Marseilles and 77 Rotterdam; E. Butterworth & Co., 98 bls. Marseilles; Atterbury & McKelvey, 173 bls. Marseilles; Castle & Overton, 56 bls. Rotterdam, 128 Havre and 141 Dunkirk; P. Berlowitz, 94 bls. Rotterdam and 180 Antwerp; J. Cohen & Sons, 29 bls. Manchester; S. Green, 15 bls. Santiago; Salomon Bros. & Co., 12 bls. Hamburg; M. Wolfer & Co., 70 bls. Havana; G. Mayer, 14 bls. Bremen; F. J. Markwalter, 48 bls. Antwerp; R. Bishop Mfg. Co., 160 bls. Dunkirk; Hartig Pulp Co., 36 bls. Rotterdam; Rudolf Wolf, 56 bls. Havre; George W. Millar & Co., 52 bls. Dunkirk; W. Hughes & Co., 23 bls. Dunkirk; National City Bank, 417 bls. Leghorn, 99 Trieste, 306 Hamburg, 87 Barcelona, 53 Manchester, 230 Naples and 174 London; Irving Bank-Columbia Trust Co., 80 bls. Constantinople; Bankers Trust Co., 16 bls. Trieste, 52 Naples and 113 London; State Bank, 83 bls. Trieste and 75 Bordeaux; Mechanics & Metals National Bank, 100 bls. Palermo, 33 Glasgow, 279 Marseilles, 412 Leghorn and 50 St. Nazaire; Equitable Trust Co., 69 bls. Havre, 38 Marseilles, 177 St. Nazaire and 28 Hamburg; Anglo-South American Trust Co., 44 bls. Havre, 117 Glasgow and 69 Hamburg; International Acceptance Bank, 163 bls. Naples; Guaranty Trust Co., 178 bls. Oran; Chemical National Bank, 40 bls. Rotterdam; Chatham & Phenix National Bank, 18 bls. Manchester; Seaboard National

In the sheet

Water Resistance

THE more rosin retained in paper, the more water resistant it is. Water resistance was studied in 4 different grades by the floating method with standard ink. In 3 grades the paper containing Quartz Quality silicate of soda showed better ink resistance.

Philadelphia Quartz Co.

Paper Sizing Division

Philadelphia, Pa.

Established 1831

ROSIN

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Originators and Oldest Manufacturers
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ALSO SPECIALIZE IN
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UNION BRONZE SCREEN PLATES
(Best phosphorized Cast Metal)
Old Plates RECLOSED and RECUT to accurate gauge
UNION BRONZE SCREWS for Screen Plates
Immediate Delivery of the Largest Orders. Satisfaction Guaranteed
The Witham Screen Plate Fastener, Patented
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All Products Guaranteed to Suit You
F. W. Roberts Manufacturing Company
Read the "ROBERTS IDEA"
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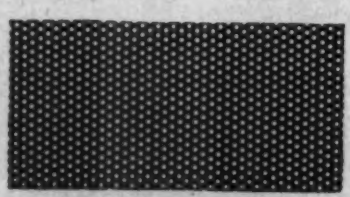
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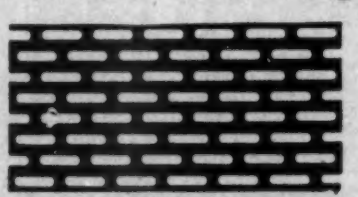
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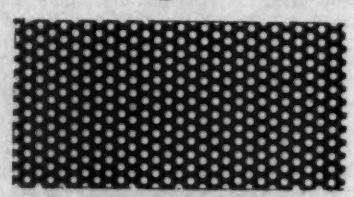
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Steel, Copper, Brass, Bronze and other alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.
CHARLES MUNDT & SONS 57-65 Fairmount Avenue, Jersey City, N. J.

Bank, 90 bls. Manchester; Crane & Co., 41 bls. Havre; W. Holvere, 82 bls. Havre; A. Hurst & Co., 45 bls. Antwerp; Murray Freighting Co., 128 bls. Antwerp; Atlantic Trust Co., 77 bls. Naples and 78 Leghorn; Philadelphia National Bank, 57 bls. Leghorn; Baltimore Trust Co., 43 bls. Leghorn; C. R. Spence & Co., 70 bls. Belfast; American Express Co., 12 bls. Liverpool; Amsinck, Sonne & Co., 238 bls. Alexandria; Goldman, Sachs & Co., 56 bls. St. Nazaire; W. Schall & Co., 78 bls. Hamburg and 17 Bremen; Brown Bros. & Co., 57 bls. Glasgow, 70 Bremen, 45 Manchester and 26 London; A. W. Fenton, Inc., 205 bls. Rotterdam, 1,078 London, 121 Cardiff, 177 Belfast and 45 Leith; Order, 431 bls. Leghorn, 32 Havre, 9 Rotterdam, 224 Glasgow, 270 Hamburg, 461 Bremen, 586 Oran, 254 Genoa, 252 Liverpool, 219 London, 502 Bristol, 157 Alexandria, 102 Manchester, 830 Antwerp and 63 Leith.

Miscellaneous Paper Stock

Whaling Waste Products Co., 92 bls. Havre, 52 Bremen, 45 Hamburg and 102 Antwerp; American Exchange National Bank, 43 bales Rotterdam; National Bank of Commerce, 13 bls. Rotterdam; Brown Bros. & Co., 153 bls. Antwerp and 98 Dublin; Fidelity National Trust Co., 42 bls. Glasgow; National City Bank, 160 bls. Bremen and 140 Hamburg; International Acceptance Bank, 73 bls. Dublin and 35 London; Stone Bros. Co., 28 bls. Havre; E. Butterworth & Co., 99 bls. Rotterdam; J. Cohen & Sons, 40 bls. London; Furness, Withy & Co., 162 bls. Belfast; Bank of New York & Trust Co., 104 bls. Copenhagen; Order, 110 bls. Antwerp, 672 Liverpool, 227 Dublin, 98 Nassau, 38 London, 224 Manchester, 571 Hamburg and 218 Dundee.

Paper

Imports of paper into the United States during April were only about on a par with recent months, judging from receipts through the port of New York, with the probability that they were a little smaller. Some sizeable shipments of news print and kraft wrapping paper arrived, while usual amounts of cigarette, filter, drawing, hanging and other grades were imported.

During February the United States imported in all 221,883,699 pounds of news print, of which 202,270,533 pounds were from Canada, according to Department of Commerce statistics. Kraft wrapping paper imports amounted to 1,608,566 pounds in February, of which 1,476,711 pounds came from Sweden. Other wrapping paper imports were 1,012,235 pounds, of which Germany supplied 620,794 pounds, Sweden 305,373 pounds and Canada 18,236 pounds. Surface coated paper imports in February amounted to 132,151 pounds, while 91,224 pounds of greaseproof and waterproof paper were imported in the same month.

Imports of paper of all kinds through the port of New York in April follow, these data being taken from the manifests of vessels arriving at that port during the month:

Printing

J. P. Heffernan Paper Co., 921 bls. and 23 cs. from Trieste; Steiner Paper Corp., 213 cs. from Rotterdam; Drinhansen & Hollkott Paper Co., 839 bls. from Antwerp and 172 bls. Hamburg; Martin & Bechtold, 27 cs. from Bremen; Keuffel & Esser Co., 143 rolls from Hamburg; Irving Bank-Columbia Trust Co., 1,100 rolls from Hamburg; Perry, Ryer & Co., 234 cs. from Glasgow; Chemical National Bank, 34 rolls from Rotterdam; B. F. Drakenfeld & Co., 43 cs. from Liverpool; S. Stern, 6 cs. from Hamburg; Robert Wilson Paper Corp., 21 rolls from Leith; H. Reeve Angel & Co., 6 cs. from London; New York & Hanseatic Corp., 22 bls. from Hamburg; Oxford University Press, 5 cs. from Liverpool; Norwegian Paper Mills Agency, 519 rolls from Oslo; Order, 63 bls. from Trieste, 28 cs. Antwerp, 151 rolls Hamburg, 4,679 rolls and 1,673 bls. Kotka, and 626 rolls and 782 bls. Bremen.

Wrapping

Southern Pacific Co., 86 bls. from Genoa; M. Haas, 5 bls. from Antwerp; Maurice O'Meara Co., 172 bls. from Trieste; F. C. Strype, 10 cs. and 14 rolls from Antwerp; Robert Cushman & Co., 3 cs. from Genoa; Chemical National Bank, 111 bls. from Hamburg; Central Union Trust Co., 38 bls. from Hamburg; W. Schall & Co., 830 bls. from Hamburg; J. P. Heffernan Paper Co., 573 bls. from Hamburg; National City Bank,

Starch

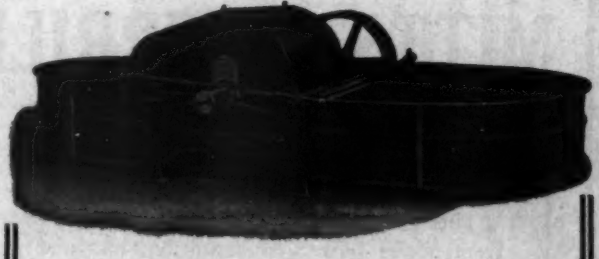
ECONOMY can never be mistaken for cheapness. In the matter of sizing material, starch is cheaper than an all-glue size, yet the results are identical—in fact, the paper made with starch sizing is stronger.

FOX HEAD NIAGARA SPECIAL PAPER

Our experts can show you how these starches can be used advantageously in your mill. They will gladly call on request.

Corn Products Refining Company
17 Battery Place New York

Starch



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Dayton Beater and Hoist Co.
DAYTON, OHIO

The survival of the fittest

The easiest way to survive competition is to reduce the cost of production.

Our equipment will help you to do this:

Jenssen Acid Towers
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Decker Cooking Process
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New Sand Filter

A SPECIAL filter for paper mills, producing all the results the paper manufacturer desires. It is a modification of the well known Hungerford filter adapted to paper mill use. It is constructed of concrete, strictly wrought iron pipe, brass strainers and especially prepared silica sand. It is as durable and efficient as can be built at any cost. It can be sold at a very low figure.

This filter gives perfectly clear water, washes thoroughly, does not require renewal of the sand bed, is absolutely reliable in the performance of its duty and requires a minimum amount of attention.

Send for full particulars

Hungerford & Terry, Inc.
CLAYTON, N. J.

MITTS & MERRILL SHEET STOCK SHREDDER

Giving the Beater a Lift

The operation of a beater, with its wear and tear and tremendous power consumption, has one primary purpose, namely, hydration. Any thing that will economically bring about hydration more quickly relieves the beater just that much, cuts down on operating costs and speeds the process of paper making.

The MITTS & MERRILL SHEET & LAP STOCK SHREDDER performs on magazines, books, old paper and boxboard, frozen or dried pulp laps in such a way as to greatly reduce their resistance to hydration when they reach the beater. It gives the beater an economical lift.

Our Shredders are built in sizes with spouts ranging from 18″ to 45″ wide. We will be glad to quote you on any size adapted to your requirements.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse

MITTS & MERRILL 1013 Tilden St. **SAGINAW, MICH.**

14 rolls from Hamburg; Birn & Wachenheim, 19 cs. from Hamburg; F. E. Wallace & Co., 22 cs. from Hamburg; Borregaard Co., 593 bls. and 3,764 rolls from Gothenburg; D. S. Walton & Co., 32 bls. from Gothenburg; Universal Paper Co., 42 bls. and 343 rolls from Gothenburg; J. Single Paper & Type Co., 128 bls. and 796 rolls from Gothenburg; Blauvelt-Wiley Paper Mfg. Co., 169 bls. from Glasgow; Irving Bank-Columbia Trust Co., 45 bls. from Antwerp; Wilkinson Bros. & Co., 113 bls. from Antwerp and 7 cs. Rotterdam; Merchants Products Corp., 273 bls. from Bremen; Order, 30 bls. from Antwerp, 3 cs. Southampton, 119 bls. Trieste, 100 bls. Hamburg, 26 rolls Bremen and 19 cs. Rotterdam.

Cigarette

F. P. Gaskell & Son, 20 cs. from Havre; Standard Products Corp., 195 cs. from Havre; Liggett & Myers Tobacco Co., 6 cs. from Bordeaux; P. J. Schweitzer, 25 cs. from Havre and 56 cs. Marseilles; Surbrug Co., 25 cs. from Havre; American Tobacco Co., 600 cs. from Bordeaux; R. J. Reynolds Tobacco Co., 870 cs. from St. Nazaire; DeManduit Paper Corp., 54 cs. from St. Nazaire.

Writing

Guibont Freres & Co., 24 cs. from Southampton and 4 cs. Havre; Frederick Loeser & Co., 7 cs. from Havre; A. Goodman & Co., 52 cs. from Liverpool; American Express Co., 4 cs. from Havre; Order, 18 cs. from Bordeaux.

Drawing

H. Reeve Angel & Co., 2 cs. from London; Keuffel & Esser Co., 27 cs. from Rotterdam and 121 cs. Hamburg; F. C. Strype, 20 cs. from Havre; E. Dietzgen & Co., 83 cs. from Hamburg; Order, 36 cs. from Havre.

Filter

A. Giese & Son, 17 bls. from Bordeaux and 5 bls. Hamburg; H. Reeve Angel & Co., 21 cs. from London; E. Fougera & Co., 46 cs. from Southampton; E. H. Danziger & Co., 4 cs. from Hamburg; J. Manheimer, 98 bls. from Bordeaux; Franco-American Importing Co., 50 cs. from Bordeaux.

Tissue

J. C. Robold & Co., 11 cs. from Liverpool; F. C. Strype, 5 cs. from Liverpool; Meadows, Wye & Co., 4 cs. from Liverpool; Baldwin Universal Co., 4 cs. from Liverpool.

Photo

Gevaert Co. of America, 141 cs. from Antwerp; P. C. Zuhlke, 130 cs. from Antwerp; F. G. Prager & Co., 13 cs. from Antwerp; Globe Shipping Co., 251 cs. from Bremen; F. Henjes, Jr., 75 cs. from Bremen.

Hanging

A. C. Dodman, Jr., & Co., 39 bls. from Liverpool and 14 cs. Antwerp; F. J. Emmerich & Co., 16 bls. from Liverpool, 2 cs. Southampton and 4 bls. Hamburg; J. W. Hampton, Jr., & Co., 209 bls. from Antwerp; R. F. Downing & Co., 28 bls. from London and 38 cs. Bremen; W. H. S. Lloyd & Co., 6 bls. from Liverpool; C. A. Haynes & Co., 43 bls. from London; Drinhansen & Hollkott Paper Co., 411 rolls from Bremen; F. A. Binder, 5 bls. from Bremen; G. J. Henken & Co., 9 bls. from Hamburg; P. C. Kuyper & Co., 9 cs. from Southampton.

Board

Draeger Shipping Co., 4 cs. from Southampton; H. H. Ayer, 15 cs. from Havre; Bendix Paper Co., 31 cs. from Hamburg; Vivaudou, Incl., 3 cs. from Havre; R. F. Downing & Co., 12 cs. from Bremen; Thomas & Pierson, 3 cs. from Havre; Adrian Vuyck, 12 rolls from Rotterdam; Metropolitan Import & Mfg. Co., 22 cs. from Hamburg; Order, 113 bls. from Trieste, 280 rolls Rotterdam and 56 bls. Hamburg.

Miscellaneous

Whiting-Patterson Co., 54 cs. from Southampton; Hudson Forwarding Co., 3 cs. from Havre; Japan Paper Co., 10 cs. from Havre, 10 bls. Rotterdam and 6 cs. Genoa; Dupont Cellophane Co., 3 cs. from Havre; Coenca-Morrison Co., 4 cs. from Havre; National Ribbon Co., 3 bls. from Rotterdam; Perry, Ryer & Co., 12 cs. from Bremen; F. C. Strype, 34 cs.

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Cut down *excessive* wrapping paper investment. Why carry two wrapping paper lines for one wrapping paper *purpose?*

MOSINEE

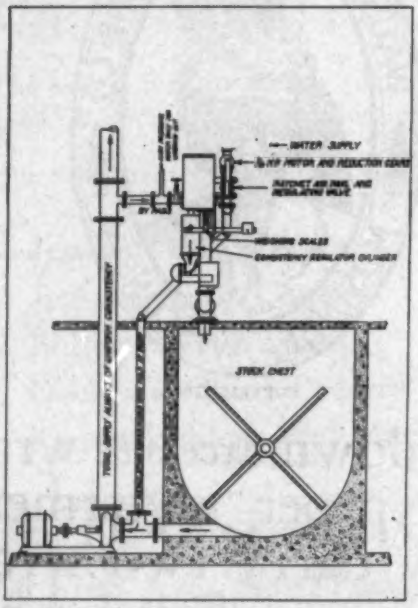
presents a perfect wrapping paper, weight and strength for each wrapping purpose. Made in all weights from 15 pounds to 100 pounds basis. The one complete, standardized and economical line of wrapping paper sold.

Mosinee Kraft

"The Wrapper that Delivers the Goods"

The Trimbey Automatic Consistency Regulator

(Patented)



Not only the FIRST but the ONLY device on the market which will control the Consistency of Paper Stock as it is being pumped.

Acts as a continuous Sampler and by adding water at the pump controls the entire volume being handled.

345 of these machines are now in use in the United States, Canada, Newfoundland and in seven Foreign Countries.

Made by

Trimbey Machine Works

Glens Falls **New York**

(Also "Made in Canada")

"MICHIGAN" Combination Steel and Wood Pipe

LONG DISTANCE CONVEYOR OF WATER AND PAPER STOCK IN PAPER AND PULP MILLS—Specially Adapted to Carry Sulphite, Ground Wood and "White Water"

Eighteen reasons why you should use "Michigan" combination steel and wood pipe

1—Durability of Wood Shell. 2—Sanitary. 3—20% more capacity than Cast Iron Pipe. 4—Simplicity in handling. 5—Light in weight. 6—Speed in laying. 7—Protects against freezing. 8—Not affected by Electrolysis. 9—Rigid inspection of materials. 10—Efficient construction of stave. 11—Strength of steel banding. 12—Protection of banding with asphalt coating. 13—Cannot burst under pressure. 14—Can be laid in a wet trench. 15—Short curves without specials. 16—Low installation and maintenance cost. 17—Responsibility of company. 18—Not affected by sulphur or chemical solutions.

THE MICHIGAN PIPE COMPANY

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Chattanooga, Tenn.....702 James Bldg.
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"Steel for Strength—Wood for Durability"

from Marseilles and 42 cs. Rotterdam; Hensel, Bruckman & Lorbacher, 10 cs. from Havre and 8 cs. Rotterdam; Kolesch & Co., 10 cs. from Rotterdam; Distinctive Writing Paper Co., 4 cs. from Havre; F. G. Prager & Co., 2 cs. from Bremen; P. H. Petry & Co., 8 cs. from Hamburg and 17 cs. Rotterdam; Southern Pacific Co., 3 cs. from Havre; Bernard, Judae & Co., 5 cs. from Gothenburg; Judson Freight Forwarding Co., 6 cs. from Havre; L. Gilbert, 19 cs. from Hamburg; J. R. Livermore, Inc., 10 cs. from Genoa; F. L. Kraemer & Co., 13 cs. from Bremen.

Foreign Trade Opportunities

Additional information regarding the following foreign trade opportunities issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce may be obtained from the Bureau in Washington, D. C., or its branch offices. It is requested that the number of the inquiry be given at all times.

No. 14296—Paper and pulp machinery. Stockholm, Sweden. Purchase and agency desired.

No. 14222—Stationery. Alexandria, Egypt. Agency desired.

No. 14493—Paper, writing, newsprint, poster and blotter. Alexandria, Egypt. Agency desired.

No. 14497—Carbon paper. Alexandria, Egypt. Agency desired.

No. 14421—Stationery. Bordeaux, France. Purchase and agency desired.

No. 14437—Caustic soda. Schiedam, Netherlands. Agency desired.

No. 14440—Rosin. Hamburg, Germany. Purchase and agency desired.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of the Paper Industry, published monthly at 356 Monadnock Bldg., Chicago, Ill., for April 1, 1925.

State of Illinois, County of Cook, ss.

Before me, a Notary Public in and for the state and county aforesaid, personally appeared E. B. Fritz, who, having been duly sworn according to law, deposes and says that he is the publisher of The Paper Industry, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, E. B. Fritz, 356 Monadnock Bldg., Chicago, Ill.; Editor, A. Scott Dowd, 356 Monadnock Bldg., Chicago, Ill.; Managing Editor, A. Scott Dowd, 356 Monadnock Bldg., Chicago, Ill.; Business Manager, E. B. Fritz, 356 Monadnock Bldg., Chicago, Ill.

2. That the owners are (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock): E. B. Fritz, 356 Monadnock Bldg., Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are (If there are none, so state): None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is (This information is required from daily publications only).

EDWARD B. FRITZ.

(Signature of editor, publisher, business manager, or owner.)

Sworn to and subscribed before me this 24th day of March, 1925.

(Seal) S. J. LEHRER, Notary Public.

(My commission expires June 30, 1928.)

"Nary A Spark—"

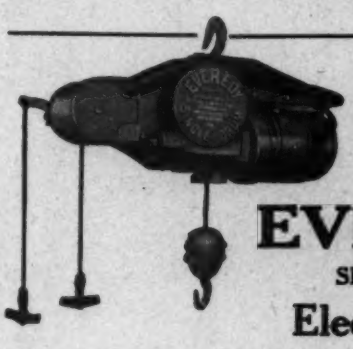
from the motor when we started, then jerked the loaded hoist into reverse.

"Show me," he said, so with the loaded Everedy Hoist traveling downward, we jerked the cord into reverse, with "nary a spark" from the motor.

Ed. Harwick was the hardest man we ever had to sell. But Ed. will tell you himself that "no other hoist has so convincingly demonstrated the superiority of its motor as the Everedy."

This motor is designed especially for hoisting, built to endure. It is easy on the commutator and brushes, maintaining a high operation efficiency.

Besides the Everedy is the most accessible hoist made. Light—500 lb. hoist weighs 215 lbs.; 1000 lb. hoist 250 lbs. Speedy—40 ft. per minute A. C., 33 ft. per minute D. C. Limit stop at top and bottom, adjustable to any point. Suspended wherever a chain or air hoist is placed. Investigate! READING CHAIN & BLOCK CORP., 2110 Adams St., READING, PA. *Manufacturers Reading Multiple Gear Chain Blocks, Trolleys, Reading Traveling Cranes.*



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COTTON
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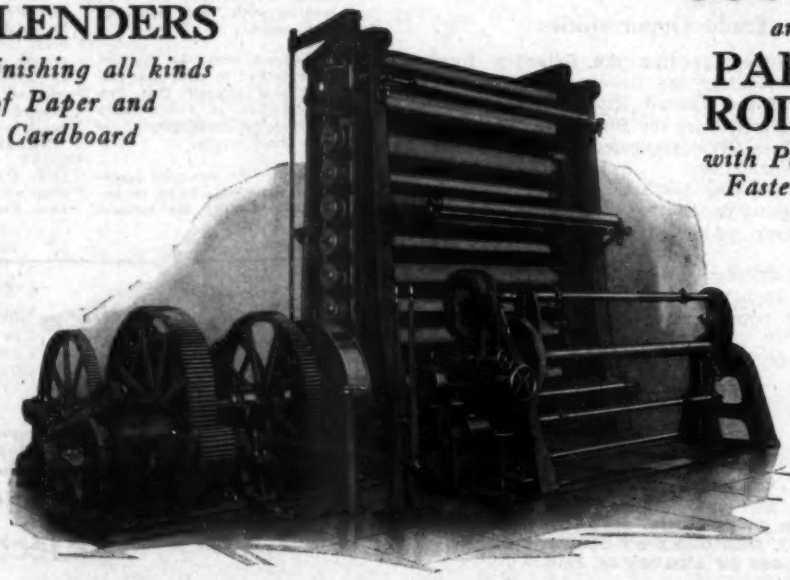
with Patented Fastenings



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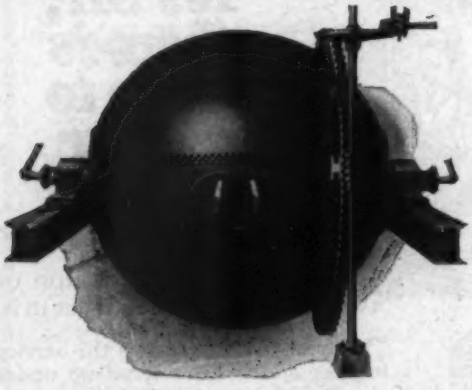

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